THE

AMERICAN JOURNAL OF PHARMACY.

MAY, 1866.

AN ESSAY ON SENNA AND ITS ACTIVE PRINCIPLE.

By Robert Rau, Bethlehem, Pa.

(An Inaugural Essay presented to the Phila. Coll. Pharm., 1866.)

There is perhaps no drug in our list of Materia Medica, in the chemical analysis of which so much difficulty seems to have been found, and concerning the results of which analyses so much variance and discrepancy exist. The active or purgative principle has for a long time been supposed to be represented by an amorphous, extractive-like substance, which has been termed "Cathartin." Within a few years this idea has been abandoned, and certain chemists have pronounced as their conviction, that the principle in question is analogous to that existing in the officinal species of Rheum, and found in Rumex Crispus, and in several genera of the order "Polygonaceæ."

The writer of this has found recorded no process nor conclusive arguments on which this announcement is founded; moreover the existence of the same purgative principle in two drugs so widely different in their botanical relations, and differing even in their more particular medicinal effects, cannot but seem very remarkable and, indeed, not very plausible. It is true, we have examples in the history of medicinal organic products in which the same principle exists in plants seemingly different in outward characters, and separated in botanical classifications.

Thus we find the alkaloid "Berberina" in the genera Podophyllum, Berberis, Cocculus, Hydrastis, Coptis and Xanthorrhiza; these representing the natural orders Ranunculaceæ, Ber-

beridaceæ, Menispermaceæ and Anonaceæ. But on examining and comparing the relationship of these orders, we will find them to possess many marked points of resemblance, indicating their close alliance in natural classification, which, indeed, warrants their consecutive arrangement in botanical works. But to bring the natural orders "Polygonaceæ." and "Leguminosæ" together, for points of resemblance even in outward characters, is beyond reasonable possibility. From such a train of reasoning we have therefore the greatest reason to doubt the fact of the existence of chrysophanic acid as the purgative principle in Senna; and it was the purpose of the writer of this paper to direct the course of his experiments primarily to prove whether this principle was to be found in the drug. The first experiment made was founded on the well known fact, that the purely alcoholic tincture of the leaves possessed *no* purgative properties.

Exp. I. Two ounces of Alexandria Senna, freed from stems and legumes, were powdered and treated in a displacer with stronger alcohol, until the menstruum passed through colorless. The resulting tincture was of a deep olive brown color, and possessed a nauseous, bitter taste. It was evaporated to a small bulk of syrupy extract and thrown into a pint of water. There was deposited an insoluble, brown resin, while the water remained green and turbid, even after several filtrations.

The precipitated resin had an acrid, bitter taste, and was readily soluble in alcohol. Its solution, agitated with animal charcoal, filtered and evaporated, left the resin of a much lighter color, but having the same nauseous odor and taste. It was readily soluble in a solution of caustic soda, from which it was precipitated, evidently unchanged by the addition of any of the stronger acids. It was partaken of in several doses of five grains, each dose being equivalent to ʒi. of the drug, but produced no purgative effect whatever.

The powder remaining in the percolator, after its exhaustion by alcohol, was acted on by cold water. The resulting infusion was of a deep brown color, perfectly transparent, and differed from a common infusion in not having so intensely nauseous a taste. Salt of the peroxide of iron produced a greenish black color, rendered lighter by slight ebullition, while gelatine gave

no precipitate, indicating the probable presence of "Gallic Acid." A solution of basic acetate of lead was added to the infusion as long as a precipitate was produced. This was of a dirty yellow color, and was collected on a filter. The excess of lead was removed from the filtrate by the cautious addition of sulphuric acid. After filtration from the precipitated PbO,SO_3, the liquid was of a pale straw color, and possessed a rather agreeably sweet odor and taste. It was evaporated to a small bulk, when there were deposited in the capsule, small, distinct yellowish crystals, seemingly insoluble in water, alcohol or ether, but were rendered white by agitation with these liquids. At the intimation of Prof. Procter of the possibility of this product being CaO,SO_3, some of the crystals were agitated with distilled water; to a part was added a solution of oxalate of ammonia, and the remainder was treated with a solution of nitrate of baryta. Both these reagents afforded the characteristic reactions of lime and sulphuric acid, the base having pre-existed in the senna leaves, and the acid resulting from the removal of the lead in the process gone over. The solution was farther evaporated, by a gentle heat, to an extractive mass, having an exceedingly sweet, and at the same time nauseous taste.

Suspecting the presence of a variety of grape sugar, a small portion was subjected to Trommer's test, which gave immediate evidence of glucose. There was apparent also in the extract a notable proportion of lime. Twenty grains taken in aqueous solution produced no cathartic effects upon the bowels.

Exp. II. To find the percentage of CaO, existing in the drug, two troyounces of the leaves were exposed to a full red heat in a crucible. The resulting mass of ashes was exhausted of inorganic salts by water, acidulated with muriatic acid. The lime was precipitated as oxalate, by oxalate of ammonia. The oxalate of lime was collected and heated in a porcelain crucible until the vegetable acid was sufficiently decomposed. The resulting mixture of CaO and CaO,CO_2, was repeatedly treated with a solution of carbonate of ammonia, heated and weighed, until the farther addition of the carbonate produced no increase in weight. The CaO,CO_2 thus produced weighed 52 grains, containing, therefore, about 29 grains of CaO, showing the per cent. of lime in senna to be 3·03.

In an article on chrysophanic acid, (Amer. Jour. of Pharm., vol. xxx. p. 442), the various reactions and properties of this vegetable principle are enumerated; and a special stress is laid upon its superior solubility in benzole. On the strength of these observations the next experiment was made.

Exp. III. Two ounces of senna leaves, powdered, were exhausted of inert resinous matter by alcohol. The mass was dried, re-packed in the instrument, and percolated with benzole. This menstruum passed through colorless, and after spontaneous evaporation left *no* residue. The mass of leaves was now moistened with very dilute sulphuric acid, dried and again treated with benzole. The result, after the evaporation of the benzole, was, as in the first trial, entirely negative. At the desire of Prof. Procter, and based upon the volatility of crysophanic acid, the next experiment was performed.

Exp. IV. An ounce of senna leaves was carefully dried of adherent moisture, and subjected to a gentle increasing heat in a "Mohr's subliming apparatus." There were *no* vapors given off until the heat was urged sufficiently to char the drug, when volumes of smoke were evolved; nor was any deposit formed on the condensing cap, except finally a faint film of carbon.

Exp. V. Eight ounces of leaves were exhausted by cold water, the infusion evaporated to the consistence of an extract, first by rapid boiling, and towards the close by a more moderate heat. This extract proved actively cathartic in a dose of 24 grains, (equivalent to ʒi. of the leaves), thus plainly disproving the assertion so frequently made, that an extract does not represent the activity of the drug, owing to the decomposition of the active principal by heat. The cold infusion possessed great aptitude to undergo fermentation, owing, doubtless, to the large proportion of glucose present, excited by the presence of some vegetable nitrogenized principle, like albumen, especially as the liquid after boiling and filtration was found to be more permanent.

The aqueous solution of this extract of senna was precipitated by the addition of liquor plumbi subacetatis, and, after filtration, the excess of lead was removed by a current of HS.; the liquid was filtered and evaporated to the consistence of an extract; this

was exhausted by Alc, again filtered, and the lime precipitated by the cautious addition of oxalic acid. After filtration, the liquid was evaporated to an extractive mass. This, then, represented the "Cathartin" of former investigators. Of the identity of *this* substance, as the active principle of Senna, there have been many reasons for doubt, and Bley and Diesel considered it as a mixture of "resinous and extractive matter."

This substance had a nauseous odor and taste, its sweetness suggesting the presence of sugar, and by Trommer's test it gave immediate evidence of glucose. Taken in doses equivalent to three and four drachms of the leaves it failed to evince any purgative effects. From this fact, the writer, as would seem quite proper, argued that the active principle had been seized upon by the subacetate of lead, and must be sought for in the precipitate, thrown down by this reagent in the original infusion of Senna.

The precipitate was therefore thoroughly washed with cold water, until traces of lead were no longer evident in the washings. After being cautiously dried it was boiled in alcohol. This menstruum became of a deep yellow color, which turned to a brownish red upon the addition of an alkali. This was evaporated to a small bulk, when there were deposited on the sides of the dish small green masses; these were collected, and dissolved in ether, to which they imparted a most beautiful green tint. This was evidently chlorophylle, the green coloring matter of the leaves. The concentrated liquid, still containing the yellow coloring matter, had become deep red, and was agitated with repeated portions of ether, to which it imparted a fine yellow color, which was immediately changed to a delicate pink by the addition of any alkali. In the original liquid (after affusion with ether) there remained a red, resinous matter. That these substances were but coloring matters, and in no wise connected with the purgative properties of the drug, was proved by their non-action upon the bowels, in doses even equivalent to two ounces of the leaves. The yellow resin thus produced is doubtless that denominated "Chrysoretin" by Bley and Diesel, and possesses, in common with chrysophanic acid, the property of being reddened by alkalies; it could not be obtained in crystalline form, but remained as a resinous mass. It was insoluble also in benzole, thus differ-

ing in this all important respect from chrysophanic acid. These coloring matters had not been in combination with the oxide of lead in the precipitate, but had been rendered insoluble in the infusion, and had been carried down mechanically and diffused throughout the precipitate. The lead precipitate was suspended in water, and decomposed by a current of HS, the liquid removed from the precipitate Pb,S and evaporated. This mass did not possess any peculiar taste, was of a gummy nature, and an acid reaction, owing to the presence of the vegetable acids existing in the drug, such probably as gallic, malic or citric. The sulphide of lead, instead of being, as usual, rejected, was collected, dried and boiled in alcohol. This liquid became of a brownish color, and left, on evaporation, a resinous substance, extremely nauseous, and similar in taste to the inert resin extracted directly from Senna by stronger alcohol. It is insoluble in water, but readily soluble in alcohol and ether.

The power of sulphide of lead as an absorbent was in this experiment somewhat exemplified; and it occurred to the writer of this, that this property might be taken advantage of in some earlier steps of the experiment.

Exp. VI. Eight ounces of Senna were infused in boiling water for fifteen minutes, the liquid strained, precipitated by liq. plumbi subacetatis, filtered, and the excess of lead removed by HS. The sulphide of lead was collected, dried, and boiled in ether. This, upon spontaneous evaporation, yielded interlaced, acicular crystals of a dirty white color. These gave on first trial no impression of taste to the palate; but in a few moments there became evident a nauseous, bitter and extremely persistent taste. They proved to be insoluble in water, hot or cold, insoluble in cold alcohol, but were soluble in hot alcohol, ether, and especially in chloroform. The ethereal solution was neither acid nor alkaline to test paper. They were insoluble in dilute acetic acid, and also in alkaline solutions, thus proving the substance to be a neutral principle.

The entire quantity which remained, amounting to nearly five grains, was taken at once, and proved actively purgative in five hours. A small proportion of animal charcoal was added to the liquid which had yielded the crystalline matter to the sulphide

of lead, the mixture well agitated, filtered, the animal charcoal dried and treated with boiling ether. This, on evaporation, yielded an additional crop of the same crystalline substance. No more could be obtained, however, by a repetition of the process, at least not more than an additional grain or two.

That this neutral crystalline substance is the long sought for "active principle of Senna," the writer feels convinced, especially upon the similarly successful determination of several experiments since made with the drug, and the undoubted purgative properties of the new product.

On heating 10 grains of the crystals in a porcelain crucible, they fused, took fire, and left a mass of porous charcoal, which was entirely burnt upon a red hot iron plate. The active principle was blackened by sulphuric acid very quickly by the aid of heat. These tests show it to be, without dispute, an organic principle.

Thinking it worthy of experiment to examine into the medicinal powers of our indigenous, officinal species of cassia, "Cassia Marilandica," which grows so profusely along the sandy river banks of our neighborhood, the writer collected a quantity of the leaflets directly after the maturity of its showy yellow flowers. An extract was prepared by evaporating the infusion, which possessed in some degree the taste of the extract prepared of the imported Senna. This proved cathartic in doses, equivalent to ℥ss. of the leaflets, notwithstanding the assertion of some authorities, that this species of cassia is entirely inert. Upon examination, the plant yielded all the coloring matters found in the commercial varieties, a somewhat similar resin, though decidedly less acrid and nauseous, a large amount of glucose, and the same crystalline cathartic principle, the yield of this, however, being smaller.

It is noteworthy that the percentage of active principle thus obtained is so exceedingly small. The rather unscientific method of its isolation may in a great measure account for this. Upon further investigation, and by capable experimenters, it will no doubt be found to exist in larger proportions in the drug, and more advantageous methods for obtaining it will be probably devised.

According to the foregoing experiments and results, the following may be set down as the constituents of Senna:—

1. A resin, soluble in alcohol and ether.
2. Gum.
3. A brown coloring matter.
4. A yellow coloring matter, "Chrysoretin."
5. Chlorophylle.
6. Vegetable albuminous matter.
7. Glucose.
8. A neutral, crystalline, purgative principle. [Sennin.]
9. Lime.
10. Gallic, and citric or some similar vegetable acids.

UNGUENTUM HYDRARGYRI.

By Gustavus Pile.

(An Inaugural Essay.)

In view of the fact that many preparations of Pharmacy formerly made by the apothecary are now furnished by the manufacturing chemist, it would appear but reasonable that the Pharmaceutist should be able, approximately at least, to ascertain the reliability of the articles he may purchase, as to purity and strength. Accordingly, tests are instituted, either mechanical or chemical, by which the value of many preparations is readily and satisfactorily determined.

In the present state of the knowledge of Pharmaceutists generally, the more simple the tests the better: complicated proceedings, or very nice arrangements of apparatus, would deter many druggists from undertaking the operation; and, although the analytic chemist, with his varied apparatus and reagents, would give more satisfactory results, yet, generally, such accuracy is not needed.

The writer, in casually experimenting with a lot of mercurial ointment, in order to ascertain its strength, was led to believe that the subject would prove acceptable for a thesis, and accordingly has noted down some observations which he thinks to be not generally known.

The determination of the relative amount of mercury present

in a sample of mercurial ointment may sometimes be a subject of importance; in fact, a druggist should make sure of the value of every lot he buys, and be satisfied that he keeps an officinal article.

Some place great dependence on the color and consistence of the ointment, and if these are as they should be, and the mercury is properly extinguished, they feel satisfied; but these appearances can easily be imitated by dishonest persons, and the ignorant, unwary or credulous druggist might be deceived.

A surer and more satisfactory evidence is found in the analytic test usually applied, that is, by extracting the mercury in a free state by distillation; we then have a clear demonstration, not only of the amount used, but also, if any portion of it has been substituted by other metals or impurities.

From various experiments made by the writer to ascertain the readiest process for separating mercury from the ointment, the three following methods were found to give results sufficiently accurate for the Pharmaceutist.

The ointment used in these preliminary experiments was carefully prepared by himself with the exact proportions of the Pharmacopœia.

Exp. 1. A portion of the ointment to be tested is put in a test tube, and to it added four or five times its bulk of ordinary hydrochloric acid; the whole is then boiled till the grease entirely separates and floats clear on the surface, an operation requiring but a few moments; pour off the liquid portion, being careful not to lose any of the finely-divided mercury. Boil the residue once or twice more with fresh portions of the same acid, until the mercury forms a globule; this is then to be washed with water, dried on bibulous paper and weighed.

With fifty grains of the ointment treated in this manner, I obtained twenty-four grains of mercury.

Exp. 2. A portion of the ointment is introduced into a test tube, and a strong solution of caustic soda added: these are boiled for a few minutes, and then allowed to stand, that all the black powder may settle; decant the liquid portion, and wash the residue with hot water, afterwards boil the finely-divided mercury with some hydrochloric acid, which will cause it to run into a globule; this should then be washed, dried and weighed.

With fifty grains of the ointment treated in this manner, I obtained twenty-three and a half grains of mercury.

Exp. 3. This is performed by dissolving out the grease by means of highly rectified benzine, and washing the residue with stronger alcohol; the resulting black powder is then to be boiled with a portion of ordinary hydrochloric acid, so that the mercury may form a globule, which is to be washed, dried and weighed.

With fifty grains of the ointment treated in this manner, I obtained twenty-three grains of mercury.

Of these three methods, the first is by far the best, yielding the mercury in a pure state with less trouble than the others, and the whole operation may be performed in a few minutes. By comparing the results of these tests, it will be seen that the first will give the largest amount of the mercury; it is also, therefore, the most accurate.

In no instance, however, did I obtain the whole amount of mercury employed in making the ointment. The bulk of the mercury being so small, the slightest loss would be perceptible when weighed; the finely-divided state of the mercury causes it to adhere so closely to the grease, that it sometimes requires considerable boiling to separate it, and here we may have a slight loss by volatilization, and even with the utmost care, a trace may be washed away; but, after all, with moderate care, the results are near enough for practical purposes.

The relative density of mercurial ointment, or its specific gravity, although not usually alluded to, may also furnish valuable information, and, as it is a means often resorted to in detecting adulterations in other preparations, I determined to apply that test also in the examination of this ointment, especially as the most usual cause of inferiority is occasioned by an insufficient quantity of mercury being employed.

To prove the delicacy of the test, I made experiments with ointments of two different strengths; the one containing 50 grains of mercury in 100 grains of the preparation; the other containing 49 grains of mercury in 100 of the preparation. The specific gravity of each was taken, which, in the first instance, was 1·700, and in the second, 1·683, showing a differ-

ence of ·017, where the difference of the mercury is but one grain in a hundred.

From actual trials with ointments made of various proportions of mercury and grease, the following table was formed:—

1	part	Mercury	to	10	parts	Grease	=	Sp. Grav.	·981
2	"	"	"	10	"	"	=	" "	1·065
3	"	"	"	10	"	"	=	" "	1·147
4	"	"	"	10	"	"	=	" "	1·229
5	"	"	"	10	"	"	=	" "	1·311
6	"	"	"	10	"	"	=	" "	1·393
7	"	"	"	10	"	"	=	" "	1·471
8	"	"	"	10	"	"	=	" "	1·548
9	"	"	"	10	"	"	=	" "	1·625
10	"	"	"	10	"	"	=	" "	1·700

In taking the specific gravity of the ointment, the following precautions are necessary:

It should be carefully introduced into a 1000 grain bottle, so that the neck may not be soiled; about 100 grains will answer. After being warmed gently so as to melt the ointment, it is set aside to cool, by which it becomes solid and free from air. The exact amount of the ointment is then ascertained, the bottle being previously tared. After filling the bottle with water at 60° F., the weight of the contents is observed and the specific gravity calculated in the usual manner. As an example, suppose the ointment introduced is 80·5 grains, and, after filling the bottle with water, the total weight is 1028·5 grains. The water alone would then weigh 1028·5—80·5=948 grains; consequently the difference between this number and 1000 is the amount of water displaced, which is 52 grains; and the specific gravity is found by dividing the weight of the water into the weight of the ointment. 80.5÷52=1·548 is the specific gravity, and by reference to the table, we see it would contain eight parts of mercury to ten parts of grease.

I may here remark that, even in an ointment properly made, a slight discrepancy from the table may occur from using different proportions of lard and suet; but the variations from this cause are but slight.

In the course of the foregoing experiments, I had procured samples of mercurial ointment from various sources, both from

wholesale and retail houses. Without further specifying, I may be allowed to state that the ointments procured from Messrs. Powers & Weightman, and from C. Ellis, Son & Co., came fully up to the proportion of 50 per cent. The poorest sample contained but 10 per cent., others contained 15, 18, 25, etc. All these samples were purchased for, and represented to be, pure officinal articles; and it shows how necessary it is for the druggist to be careful, and fully understand the character of the preparations he may have occasion to purchase.

THE PHYSICIAN'S PRESCRIPTION. TO WHOM DOES IT BELONG?

Vicksburg, Miss., March 28th, 1866.

Editor American Journal of Pharmacy:

Dear Sir:—I desire to present to your notice some views that have been engendered by the observation and careful study of the subject for the past year, as applying particularly to this section of the United States, namely: The ill effects of the renewal of prescriptions without the sanction of the Physician, and the best method of correcting the evil.

There *are hundreds* of recipes repeated that the Physician never authorized. When a Physician is called to see a patient, he writes his recipe, for which he is duly paid. *That fee* is tendered him for the medical knowledge and skill he supplies, as bearing on that *special case* of sickness. Now, when the patient has recovered, (through the beneficial effects of the medicine,) he has received his equivalent for money invested. Has that patient any right to use the recipe again for another attack of sickness? *I* think *not*; but *that* view only relates to the injustice done the Physician; now for the main point: The patients, (especially the poorer and more ignorant classes,) not only constantly repeat recipes without the sanction of the Physician, for *their own use*, but they will give it to other members of their own family, and, in numerous cases coming under my own knowledge, they *sell* the recipes to others of their acquaintance whom they fancy it will relieve, simply because it cured them. The constitutional effects of the same remedies in different temperaments

are well known to medical men, and what will cure one child will either have no good results or injure seriously another.

Take a case of a grown person, for example, who has been treated mercurially for syphilis; he may take from 10 to even 40 grains of iodide mercury in one-third grain doses without accomplishing the object of the Physician. He finally is cured, and having his accumulation of boxes and vials, he starts up in the "amateur speciality" business, and sells to his friends his boxes, with directions on them, (so as to *get even*, as one of our freedmen expressed it to me.)

The person who now holds the "amulet," tries the same quantity, and in about two weeks is ptyalized, and comes quarrelling with the dispenser, saying that the medicine was not compounded correctly.

I asked a white man, who had been steadily getting iodide of mercury in pills, and after that iodide potassium and sarsaparilla, why it was that he was not well. Oh! says he, I have been all right for two months, and *these* are for my partner, who is down with the same disease.

The entire system is wrong, and, as it is a growing evil, something should be done to check it, either by Legislative enactment or by preconcerted action of Pharmaceutists and Physicians. Thus, let no Apothecary renew a recipe, except under the signature of the Physician ordering it.

Please give the subject some attention.

Very truly, yours,

W. P. C.

[NOTE.—The subject of this letter is an old one, and upon which neither Physicians nor Apothecaries agree sufficiently to induce any general action. In the first place, the constant habit of many Physicians is opposed to the wish of the writer. They direct their patients verbally to get prescriptions renewed, and many know that their prescriptions are used habitually as family medicines by their patients, and don't object.

Other Physicians are directly opposed to this course, and in some instances, on a printed blank, direct the Apothecary not to renew the prescription without written directions from the prescriber. Pharmacy in England and France is older than in the United States, and in those countries when a Physician writes a prescription and hands it to the patient, it becomes his property after the fee is paid, in evidence of which the Pharmaceutist returns it to him after copying. This is the view gene-

rally taken by the *people* of this country, and our College of Pharmacy, while it urges that the Apothecary should keep the original prescription as his guarantee in case of error by the prescriber, does not even by inference withhold a copy from the patient. The number thus copied is quite small compared to the whole number, being the exception and not the rule. If, then, the patient has a right to the prescription, by inference he has a right to use it, but at his own risk; and until Physicians attempt to invalidate this right by a unity of action among themselves and with Pharmaceutists, by considering each prescription as a sort of patent granted for a special case, and cause this to be supported by Legislative action, we cannot see that the views of our correspondent could be carried out. We agree with him, however, that harm may be and is done, but, on the other hand, much benefit may arise in cases where the Physician may be absent. The main difficulty is *that* pictured by our correspondent, where the prescription is used as a source of pecuniary profit, under circumstances calculated to do mischief, and certainly never intended by either Physician or Apothecary. Any action in this matter should be based on the general interests of medicine and the community at large, and be the result of deliberation.—Ed. Am. Journ. Pharm.]

ON THE PURGATIVE CONVOLVULACEÆ.

By M. Andouard.

This paper, as it appears in the *Journal de Pharmacie* for February, 1866, page 107, is a report by M. Marais on a thesis sustained by the author before the Societé de Pharmacie de Paris.

We know, at this time, two kinds of jalap: *Exogonium purga*, which is the officinal jalap; and *Ipomea orizabensis*, which is designated in Mexico under the name of male jalap, and which we know under that of fusiform.

These two plants, very different in a botanical point of view, and very different, also, in the aspect and composition of their roots, are common in Mexico, where, according to M. Mendez, cited by M. Andouard, they are found always together. The collection of jalap is made immediately after the rainy season in May. The roots are cleansed and deprived of their stalks which accompany them from the mountains. At this time, they are brown externally, and yellowish within, gorged with a milky juice. They are afterwards dried in the sun, or more frequently by direct heat of a fire, which has the inconvenience of causing some of the resinous matter to exude, and of giving the root a blackish brown appearance.

Several facts are presented of a novel character, that were derived from M. Boucard, a young naturalist, who spent several consecutive years in Mexico.

It was known that jalap grew spontaneously in the environs of Xalapa, and in the principal Sierra within a certain zone of its altitude, varying from 1,500 to 2,000 metres above the level of the sea; but what was previously unknown is that this altitude is necessary to the vegetation and complete development of true jalap. They have sought to acclimate it to the lower height of the plateau of Xalapa, and have planted it particularly at Huatusco; but these attempts have not given satisfactory results.

According to the observations of M.M. Boucard and Mendez, jalap grows by preference in the mountains, in cool and moist places. The most beautiful individuals were encountered in a porous light soil, shaded by a forest of pines and oaks; and whenever a place of suitable altitude occurs where a torrent descends, jalap is certain to be found on its borders, sheltered from the sun.

Besides the two jalaps which have been noticed here and are in commerce, M. Andouard has observed a third sort, called Tampico, but in truth of unknown origin. To these three sorts, it is necessary to add a fourth, recently introduced into France, and which M. Guibourt has provisionally called digitate.

These different species of jalap are very far from having the same value, that is to say, the same content of resin. In taking tuberous or officinal jalap of good quality as a type, we find it contains from 16 to 17 per cent. of resin, and that male jalap of Ledanois, or fusiform jalap contains from 9 to 10 per cent., according to Ledanois himself, following our best authors, and according to the repeated and varied essays of the Commission. M. Andouard, on his side, alleges the proportions of from 14 to 20 per cent.—more than in the tuberous jalap—whence he believes that he is able to conclude that the therapeutic value of these two jalaps, tuberous and fusiform, is at least equal.

M. Marais regards this affirmation as premature after he examines the results of other experimenters, and considers it dangerous, because it furnishes a pretext for substitutions and

falsifications which are practised but too easily. Do we not, in fact, see fusiform jalap sold daily, to the exclusion of true jalap, under the false name of "jalap stalks," and afterwards, fusiform jalap itself held in check by this new arrival of large finger jalap, which contains but two per cent. of resin.

The committee represented by M. Marais regret that a sample of the fusiform jalap, examined by the author of the thesis, had not been sent to them, and which had produced such an unprecedented yield of resin.

Table of the Comparative Quantities of Resin yielded by Different Varieties of Jalap :—

	M. Andouard. Per cent.	Committee. Per cent.
Jalap—Tuberous or Officinal (*Exogonium purga*)	12 to 14	16 to 17
" Fusiform (*Ipomea orizabensis*) . .	10, 14 to 20	9 to 10
" Tampico	4 to 5	3 to 4
" Large Finger (*digité*)		1·5 to 2
" Small Finger		2 to 3
" Black, rec'd. by way of Vera Cruz, (origin unknown)		8 to 10

In regard to the discrepancies in these results, M. Marais doubts the similarity of the tuberous and fusiform jalap examined; and, besides, believes that a variation in the mode of extracting the resin must have occurred, and then puts the question whether, in equal doses, these resins have the same purgative property. M. Andouard says "yes," for the two principal kinds at least. The Committee have not been able to fully respond to this question, as the specimens placed in the hands of several hospital physicians could not be used, owing to the epidemic cholera prevailing. They can say, however, that one of the members took the resins in doses of 25 to 40 centigrams, (3½ to 5½ grains), and found the effect of the tuberous jalap to that of the fusiform in the ratio of 5 to 3. The resins of the other varieties were not tried.

SCAMMONY.

M. Marais says that this part of the thesis did not offer much that is new, regrets that M. Andouard has not been in a position to prosecute his researches more closely into the value of the varieties of scammony, and hopes that he will have the heart to take hold of the task with so good an object in view.

The author disapproves of the English plan of extracting the resin from the dried roots of the scammony plant, because it is not accompanied by gum and odor, as is the natural exudation; but this remark certainly will not apply to the resin of scammony made from scammony itself. M. Marais thinks that, in a drug where 70 to 75 per cent. is active matter, there is little need to extract the resin; and that a long experience proves that good scammony is sufficiently well marked to be recognized, even if there were no other characters than the five that M. Dubail has designated. A good scammony should be grey, light, friable, lactescent and odorant. [The experience in this country goes to prove that commercial scammony cannot be relied upon, and hence the U. S. Pharmacopœia directs the resin itself in compound extract of colocynth.]

THE ROOT OF TURBITH.

The observations on turbith are more substantial than those on scammony, but the subject is of less importance. We think, with M. Andouard, that this root is a good purgative, that it offers the advantage of being easily managed, and, further, that it is very abundant, as, according to M. Lepine, it grows wild in the forests near Pondichéry; but, notwithstanding its qualities and abundance, it is to be feared that the indifference of physicians to its use will not be changed. M. Andouard has not hesitated to experiment on a number of samples, of which the mean value of the resin was 10 per cent. This richness in active matter is sufficient to class turbith, in therapeutic value, with jalap at 16 per cent., and scammony at 75 per cent. of resin. The following is his analysis of turbith root, which is the most complete extant: Water, 3.60; Resin, 10.20; Gum and Albumen, 7.20; Starch, 12.35; Sugar, 0.51; Lignin, 52.70; Mineral Salts, 9.80; Loss, 3.64.

The Méchœcan and the roots of indigenous bind-weeds are only mentioned to complete the collection of purgative convolvulacea.

CONCLUSIONS.

The thesis of M. Andouard is very substantial, and of great interest for Pharmacy. The most important point of interest is

that relative to the influence of altitude, temperature and soil on the spontaneous development of the true jalap. But, in reference to the exaltation of the value of fusiform jalap, M. Marais believes it premature, and that such results should only be recognized after new and thorough analytical essays and therapeutic trials. On the whole, however, the Committee consider the thesis of M. Andouard, in the arrangement of its several parts, and in the compilation of the whole, exhibits a practiced hand beyond that of a beginner, and which, they hope, will yet render more than one service to Pharmacy.

In consequence of this report, the "Societié de Pharmacie de Paris" has decided that the author has merited the thesis prize for the year 1865, and expresses its satisfaction with his labors, hoping they will prove an encouragement to young men to prosecute the study of the natural sciences, too much neglected at this time.

NOTE ON OLEORESINA CUBEBÆ.

By William Procter, Jr.

The purpose of this note is two-fold,—to point out an imperfection that occurs in some of the commercial specimens, and which materially injures the value of the preparation, and to offer a few remarks in reference to its manufacture. By the officinal process the powdered cubebs is exhausted by percolation with ether, that is to say, for every 12 troyounces of cubebs 24 fluidounces of percolate is obtained. The percolate is then made to yield eighteen fluidounces of ether, by means of a water-bath still and a good refrigeratory, after which the residue is exposed in a capsule until the remaining ether has evaporated. It will be proper to remark, by way of illustration, that cubebs contain volatile oil, soft resin, cubebin and waxy matter, that are soluble in ether, and all of these, except the latter, are more or less active. When carefully made, oleoresin of cubebs has a dark green color, varying from dull green to deep grass green, according to the condition of the cubebs treated, that is to say, according as the berries contain more or less chlorophylle, due to their greater or less ripeness when collected. The specific gravity of the oleoresin is not uniform, owing to the variable propor-

tion of volatile oil in cubebs, and to its more or less perfect freedom from the last portions of the menstruum used; and this brings me to the imperfection alluded to in the beginning of this note. It has repeatedly occurred that the oleoresin purchased of druggists has a decided ethereal odor, is quite thin in consistence, and sometimes has a considerable quantity of crystals of cubebin in a separate state, either floating in the liquid or adhering to the sides and bottom of the phial. Now, the presence of ether is objectionable as a dilutant, as facilitating the crystallization and separation of the cubebin by thinning the oleoresin, and lastly, from altering its medical properties; and the apothecary should either return the preparation as imperfect, or, submitting to the loss, expose it in a capsule until the ether evaporates. One specimen, bought as genuine, when thus treated, lost three-eighths of its weight by spontaneous evaporation in a short time! As regards the separation of the waxy matter and cubebin, the former tends to deposit first, and the cubebin afterwards, with more of the wax. This occurs in the most carefully prepared specimens, but the separation occurs more slowly when the concentration is perfected at once in a distillatory apparatus with a regulated heat, than by gradual spontaneous evaporation. The high price of ether has suggested the idea of using other and cheaper solvents, as alcohol, bisulphuret of carbon and benzole; and I have recently tried the purest commercial "benzine," which, when dropped on paper, left no odor after a few moments exposure to the air, and, so far as the quality of the preparation is concerned, it affords an excellent preparation, less disposed to deposit than either the alcoholic or ethereal oleoresin. The product is greatest by alcohol, owing to the removal of more extractive matter probably.

The following results were obtained with ordinary ether of commerce, sp. gr. ·750, with stronger alcohol that had been shaken with carbonate of potassa, and with good benzine of sp. gr. ·705. In each experiment 1000 grains of cubebs was packed closely in a conical percolator arranged for volatile fluids, and the several menstrua poured on until the bulk of 1000 grains of water at 60° F. was obtained; the receivers were then changed, and the percolations continued until an equal additional quantity of percolate from each was obtained; the specific gravity of the several first liquids was then taken, and afterwards each of them

evaporated in a warm place till they ceased to lose weight. The second liquids were then evaporated. The results are exhibited in the following tabular view:

Cubebs treated.	Menstruum used.	Quantity of 1st percolate in grain measures.	Oleoresin yielded.	Quantity of 2d percolate	Oleoresin yielded.	Total oleo-resin.	Per centage.
1000 grs.	Ether.	1000	205	1000	14	219	21·9
1000 grs.	Alcohol.	1000	240	1000	30	250	25·0
1000 grs.	Benzine.	1000	140	2000	25	170	16·5

The products by alcohol and ether were both cloudy, from a portion of deposited matter, whilst that by benzine remained clear and free from deposit. The specific gravity of these products varied; that from benzine was ·9325, that by ether ·9675, that by alcohol ·9850; whilst the commercial sample alluded to as containing ether, was only ·9000, with a deposit of cubebin in the vial. The trials were at the temperature of 76° F. To determine whether the benzinic dregs contained matter soluble in ether, a portion of the latter was poured on the dregs until the absorbed benzine was displaced, when the percolation with ether was continued until 1000 grains had passed. It had a green color, and on evaporation yielded a residue of 28 grains, consisting chiefly of cubebin, with a little waxy matter and chlorophylle, but no volatile oil, and but little pungent resin. Cubebin appears to be but slightly soluble in benzine, and until it be settled that it has no medicinal virtue, it will not do to employ benzine as a solvent in making oleoresin of cubebs.

From these results it is apparent that nearly the whole of the oleoresin is removed in the first percolate, and that 1000 grains measures of ether in the second only produced one-fourteenth as much of oleoresin. As this applies equally to all, it points to the propriety of stopping the percolation earlier, and sacrificing the little oleoresin left in the dregs.

CHEMICAL RESEARCHES ON THE MYRTLE OF AUSTRALIA—*EUGENIA (JAMBOSA) AUSTRALIS.*

By MM. De Luca and Ubaldini.

This tree, which grows admirably in the open air, and with no care for culture, in the Botanical Garden of Naples, attains the height of about forty feet. Its straight and cylindrical

trunk gives rise to numerous branches, which bear an abundance of deep green elongated persistent leaves. At the extremity of the young branches, and at the insertion of the leaves, appear whitish flowers, to which succeed pendant fruit, of a beautiful violet red, about the size of cherries, but of an elongated form, and an agreeable, slightly sweet and acidulous taste.

The tree, during nearly six months of the year, (from November to March,) is covered almost continuously with flowers and fruit—a rare thing in our country [Italy].

The juice obtained by expression is of a beautiful violet red; its taste is very agreeable and slightly acid; by concentration and repose, it deposits, among other things, a crystalline substance which is cream of tartar; this juice, which contains glucose, ferments at the ordinary temperature with the disengagement of CO^2 and the production of alcohol, which may be obtained from it by distillation.

The coloring matter of the fruit of the Australian myrtle is very soluble in water and alcohol, and yet better in a mixture of alcohol and ether, although it does not dissolve in pure ether. Purified animal black retains this coloring matter as it does that of must or red wine.

The action of the air and of fermentation changes the violet red color of the juice to vinous red; the ordinary acids redden it, and the alkalies give a beautiful green tint. Paper colored by the juice, preserved from contact with the air, will act well as test paper for acids and alkalies.

Reducing agents, such as alcoholic ether, sulphohydric acid, or, better, nascent hydrogen, decolorize the juice of the fruit of the myrtle, but afterwards, when exposed to the air, it regains its primitive color.

The coloring matter of wine or that of tournsol comports itself with nascent hydrogen in a similar manner.

Red wine and the juice of the Australian myrtle are precipitated by acetate of lead; these colored precipitates, when they are decomposed by diluted chlorohydric acid in the presence of ether, afford a white precipitate of chloride of lead, beneath two distinct layers of liquid; the lower being water containing the coloring matter; the upper, colorless ether.

The juice of the fruit of the myrtle of Australia, after fer-

mentation, that is to say, *myrtle wine*, acquires by time a peculiar ethereal, very agreeable odor, which is the *boquet* of the wine. The same juice, not fermented, gives by evaporation a syrupy sweet substance like that from grape juice.

Myrtle wine, when evaporated to a tenth part, and allowed to repose during twenty-four hours, deposits crystals of cream of tartar. This same wine, agitated with double its volume of a mixure of ether and ordinary alcohol in equal parts, deposits little crystals of cream of tartar on the sides of a matrass, well stopped, after twenty-four hours repose.

Lastly, this wine, besides cream of tartar, contains free tartaric acid, which can be precipitated by alcoholic ether, after transformation into cream of tartar, by adding a little potassa.

All these experiments show a close relationship between the fruit of the grape and that of this myrtle of Australia.

The myrtle indigenous to Sicily, bearing small white fruit which contains cream of tartar and free tartaric acid, also will yield wine.—*Jour. de Pharmacie*, Jan., 1866. W. P., Jr.

EXTRACT OF HEMLOCK BARK (*ABIES CANADENSIS*)—A NEW AND VERY CHEAP ASTRINGENT.

By N. Spencer Thomas.

Mr. Editor:—Having become extensively engaged in the manufacture of Extract of Hemlock Bark "evaporated in vacuo" for tanning leather, I have frequently observed a very great similarity between it and the Extract of Rhatany, of which I used to make large quantities, both for my own sales and for other parties. The Extract of Hemlock seems to have exactly the same appearance, both before and after drying, as the Extract of Rhatany. As far as I know, it has no other properties about it than the astringency of the tannic acid. I should suppose it would answer all the purposes for which Extract of Rhatany is used in medicine and for the purposes of dyeing its own natural tan color, and black, and also for making ink. As it is the cheapest form in which tannic acid can be purchased, it will undoubtedly be applied to many useful purposes when it becomes known. As I am under the impression that

this article may become a valuable addition to the "Materia Medica," I take this method of bringing it to the notice of those interested. In manufacturing this article, the evaporation is performed in "vacuo," and our customers, who use the article in tanning, have repeatedly tried our make in comparison with an article made by open evaporation, and they willingly pay us from 50 to 100 per cent. more for ours than they can buy the article made in open evaporation. This proves conclusively the great merit of the vacuum pan in making solid extracts, or for most kinds of evaporation.

We are now selling this extract at ten cents per pound, delivered at the depot, here, in boxes of 170 lbs., and will send a single box to any druggist that may want one. Small or large quantities can be obtained from Mr. Iredell, at No. 120 Exchange St., Philadelphia, at a small advance on the above price. This article is a pure extract of the bark of the hemlock tree, or Abies Canadensis, and should not be confounded with the other hemlock, or conium, as it has none of its properties, but is a pure astringent.

N. SPENCER THOMAS.

Painted Post, New York, April, 1866.

MANUFACTURE OF COD LIVER OIL IN NORWAY.

BY J. LEON SOUBEIRAN.

Having been charged in the month of August last by the Zoological Acclimatation Society to go to Bergen, in Norway, to study the exhibition of fish which was to be held there, I have received some information on the manufacture of cod liver oil, which I believe offers sufficient interest to the pharmaceutist for me to make it known.

Until latter years the cod liver oil of commerce was obtained by the crude process of fermentation or putrefaction, the livers being thrown into barrels, and abandoned to themselves until the oil separated and arose to the surface, whence it was removed for use. Thus obtained, it is always colored brown, and has a repulsive taste. The idea of heating the livers to extract the oil is of comparatively recent origin. This process, as applied

in Norway by small manufacturers, is carried out by conducting the steam from a cylindrical boiler by several pipes into as many barrels containing the livers, each furnished with stop-cocks at different heights. As the steam operates, the lighter colored oil separates and rises to the top, and should be drawn off as soon after it separates as possible. The oil obtained afterwards is more colored and odorous, and it is thought that the solvent action of the steam extracts such substances as iodine and bromine compounds from the oil, and thus injures it.

To obviate this inconvenience, most of the regularly organized factories in Norway have an apparatus consisting of a vessel surrounded by a steam jacket, so arranged that the oil can filter off in measure as it separates, which is considered to be a great improvement. This apparatus consists of a cylindrical vessel enclosing another cylindrical vessel of smaller diameter and less height, joined steam-tight to the first by a rim at the top. The inner vessel has a conical diaphragm, dividing it into two parts, which diaphragm is constructed of some material which acts as a filter, admitting the oil to flow into the lower apartment, whence it is drawn off by a stop-cock, passing latterly through the steam chamber. This arrangement answers a good purpose.

We saw at Bergen an apparatus made by one of our pharmaceutists, M. Bouilly, which has appeared the simplest and most convenient of all. This consists of a cast-iron boiler, so arranged that a large curved tube passing through it constitutes part of the chimney of the furnace which heats it. From the top of this boiler four pipes convey the steam to four jacketed conical boilers, each capable of holding three or four barrels. The livers are placed in these, duly disintegrated, and as the oil separates it is removed at once into a large vessel called a *Kyler*, to cool. During its cooling it becomes clear, forms an abundant deposit from which the oil is decanted and preserved in tinned iron vessels, which are preferable to wooden barrels, which sometimes give color to the *very white oil* obtained at the commencement of the process.

When the livers are thus exhausted of the white oil, they are removed to a large boiler and heated by a regulated direct heat, until much of the oil remaining separates as a *blonde oil*,

much used by the Norwegians for illumination. The residue is yet further treated to get a brown oil, used in the arts, whilst the final residue, of a resin-like matter, is used by the farmers as a manure.—*Journ. de Pharm., March*, 1866.

W. P., Jr.

NOTE ON RECTIFIED OIL OF AMBER AS A REMEDY FOR HÆMORRHOIDS.

By William Procter, Jr.

Of the large number of persons who suffer from this annoying complaint, very many never consult a physician, and many others after renewed treatment give up the idea of becoming cured, viewing the affliction like some do old ulcers, as a burden to be borne while life continues. Various external applications are constantly prescribed, as an ointment of acetate of lead, tannin or nutgall, and opium, which is often successful in affording relief. Numerous secret nostrums have, from time to time, attracted attention, indicating the prevalence of the disease. Several years ago my curiosity was excited by the repeated calls for rectified oil of amber by a person who was not in any way connected with medicine, and he was asked the use to which it was applied. He said it was for piles, and that he rarely knew it to fail, the numerous calls that had been made being for friends and acquaintances who were sufferers from the complaint. After that, on several occasions where opportunity offered, it was suggested and tried with success, in many cases of piles where the tumors were external and annoying. The manner of its curative action I am not aware of. The oil is applied as a lotion to the tumours, and around the anus where the swellings exist. It occasions a smarting sensation at first, but after several applications the sensitiveness disappears, and the tumours are dissipated. So far as is known to the writer the influence is entirely local, and does not extend beyond the parts to which it is applied. I am not aware that it has been applied beyond the sphincter ani to the internal tumors, but know of a case wherein both internal and external piles existed, the latter disappearing, and the others continuing to give annoyance. The object of this note is to ask the attention of medical men to the subject, that the ac-

tual value of the oil of amber as a remedy for piles may be satisfactorily tested. It may be that in some cases admixture with lard or cerate would be preferable, and in the form of an emulsion, or associated with glycerin or olive oil, it might be applied in the rectum by injection or by a bougie. These are mere suggestions to the physician.

It is to be regretted that so little genuine oil of amber is to be obtained, as has been conclusively shown by Mr. Ebert, of Chicago, (see page 146 of this volume,) who finds that it costs as much per ounce to make the oil as it sells for in commerce per pound. Failures may be attributed to the spurious oil made from turpentine and coal oil, shaken with oil of tar and some oil of amber.

A COMPARISON OF DR. SQUIBB'S PLAN FOR ECONOMIZING ALCOHOL AND N. SPENCER THOMAS'S PATENTED PROCESS FOR MAKING FLUID EXTRACTS.

By N. Spencer Thomas.

When an article on Fluid Extracts was published in the March, 1865, number of the Journal, the Editor suggested that, as the process was new, it would be well for the inventor to submit his process, as early as practicable, to a committee of Pharmaceutists, that its merits might be tested. This was done as far as could be on my part, but no action by a committee could be had, although more than a year has elapsed; and, as I have been closely engaged in business away from the city, I have only recently seen Dr. Squibb's remarks about my process, in May, 1865, number of the Journal, and his proposed plan for saving alcohol, in the March, 1866, number. I could see, on reading his remarks about my process, that he did not properly understand it; as he says it will do for some drugs and not for others, naming some of those which he would put into each list. Some of the drugs which he thinks it will not do for, are the very ones it does for to the greatest perfection; or, rather, for which the advantages of the plan are most striking. I claim and believe—in fact, I may say I know—it is perfection for all drugs. It is more simply and easily applied—that is to say, can be properly applied by a less skilful person—than either

the Pharmacopœia process or Dr. Squibb's method, and will produce more regular and uniform results than either. Dr. Squibb is also wrong in so publicly questioning the validity of my patent, as his instance given, where he had used, as he says, the same process, happens to have been in making a solid, and not a fluid extract.

My patent is only on my particular process for making Fluid Extracts, by means of which the object is accomplished, and heat, evaporation and prolonged exposure to air are all avoided. I do not claim a press, or the use of a press—it happens that the process cannot be carried out without using a powerful press, but any sufficiently powerful press can be used. The plan or process consists in merely moistening the properly ground drug with three-fourths of its weight of menstruum, allowing it to stand a few hours, then submitting it to a very powerful pressure, then breaking up the cake, and adding the remaining one-fourth of its weight of menstruum, and, after thoroughly incorporating the fluid with the drug, again submitting it to the same pressure; this, with the first pressing, can be weighed or measured, and, by subtracting this amount from the amount of finished extract required, gives the amount of liquid yet to be applied to the drug, to make the required amount of finished extract, and can all be applied for a third pressing, or be divided for a third and fourth pressing; when these various pressings are mixed, the extract is finished.

Presses can now be furnished for two hundred and twenty-five dollars, capable of effectually carrying out this process; and I am now granting individual rights to use the process for a small patent fee on each pound of extract, when made. By this plan, no investment is required in advance for patent fee, and only two hundred and twenty-five dollars for apparatus, as nothing is required but the press. The matter has been neglected for over a year, because I did not suppose it could be carried out at an outlay of less than two or three times the amount of money; but, by reducing the size without reducing the power of the press, and putting the patent fee in the form of royalty, almost every apothecary is enabled to avail himself of the advantages of this process. The fee will be less than the actual saving of

alcohol over any other process, after the investment is made in the press, which is always worth the money it costs. The Fluid Extracts can be made cheaper and a great deal better by this than by any other process. I adopted and used this process extensively before the advance in price of alcohol. The saving is, of course, much greater since the great advance in the price of that article.

In comparing the two plans, Dr. Squibb's has the preference in one point, that is, it can be carried out with a much cheaper apparatus than mine can; but, with the necessary press, my plan will produce a much more definite result, and will save menstruum, time and drug, and can be carried out by a less skilful hand than either Dr. Squibb's or the Pharmacopœia plan. It is very evident, from a study of the Pharmacopœia, and also from a study of Dr. Squibb's and other articles on the Fluid Extracts, that the effort, all the way through, is to accomplish exactly what my process does effectually accomplish. The whole effort or aim, in almost every formula in the Pharmacopœia, is to avoid heat and evaporation, as shown by reserving, in most cases, three-fourths of the amount to which neither is applied. The Pharmacopœia formulæ are right as far as they can go right, which is just three-fourths of the way—at least, apparently so—that is to say, they would be right, if the remaining one-fourth could go on in anything like same ratio; but it cannot; therefore, the imperfect plan adopted by the Pharmacopœia for obtaining the last one-fourth was the best plan then known. The first three-fourths obtained by my process will contain much more of the whole strength of the drug than the first three-fourths obtained by displacement; this leaves the last fourth, in my case, capable to practically take out all the remaining strength of the drug, which cannot be done by displacement.

Dr. Squibb's plan goes apparently right farther than the Pharmacopœia; but, as it goes on precisely the same plan—that is to say, a plan of which he says, himself, that no reasonable continuation will absolutely exhaust the substance of soluble matters or of the alkaloids—it seems to me that any better plan should be adopted in preference. Dr. Squibb's plan is extrava-

gant where high-priced drugs are operated on. It would be good for low-priced drugs, if the proper stopping-point could be known in each individual operation; but, in addition to varying with each drug, there would be a great variation in the same drug with each different operation; a very slight variation in strength of menstruum, temperature, time; shape of percolator, fineness of drug, amount of moisture applied before putting into percolator, slight variation in pressing it into percolator, and, perhaps, some other points would make so much variation, that it would be entirely unsafe to adopt any such plan, of which, I believe, the Doctor himself is satisfied. It is true that some of the same influences enumerated above may act so as to vary slightly the result of an operation by my plan; but, under reasonably favorable circumstances, and with any moderate degree of care in following out my directions about the process, and with a proper solvent or menstruum, the result must be very close to the proper point of exhaustion.

A very important part of my process is to keep the menstruum of same strength all the way through each individual lot or operation. This I conceive to be a very important matter in exhausting the strength as well for preventing precipitation when the different liquids are mixed at the end of process. There has been—and very properly, too—a great deal said about the impropriety of deviating from the standard formula, even though it be an improvement. I would ask the question whether, when we can read almost as plainly as if it were printed in the formulæ, that the formulæ is an attempt to make sixteen ounces out of sixteen ounces, but stops at twelve ounces, and then does the best it can with the other four—whether there is any good reason why, if a practicable plan for making the last four ounces in such a manner as to practically carry out the same idea as is applied to the first twelve ounces, it should not be adopted. I fully agree with the greatest sticklers for standard that no deviation should be made from the standard that in any way lessens or injures the quality; though I have found there are very few apothecaries or druggists carrying out the formulæ of the Pharmacopœia now, in the making of the

Fluid Extracts; nearly all have some way of their own of cheapening them, particularly the large operators.

Dr. Squibb's paper gives many valuable suggestions which are really in favor of my process. He arrives at the fact that the medicinal virtues are easiest soluble; this is certainly in favor of a plan using so small an amount of menstruum as mine. He speaks of the amount of alcohol directed for moistening the drug previous to displacement affecting the operation very materially, and the amount directed by the Pharmacopœia not being the best quantity. This shows how small a matter may affect the result by displacement in the hands of an unskilful operator. He also speaks of the trouble in some cases by impaction; this trouble there is no provision against, and with an unskilful operator would very seriously affect the result. This difficulty cannot occur with my plan. He speaks of the point of absolute exhaustion never being attained in displacing. This can be attained much quicker by my plan than by any other. By pressure, as I propose, we have all the advantages of displacement without any of its disadvantages. The menstruum with which the drug is first moistened, being about the same either for displacing or pressing, I believe that if pressed out it carries with it a much larger amount of solid extract than if displaced out. Then the second addition, having a weaker drug to operate on, I think carries its strength out more perfectly than if displaced. If we divide each operation into fourths, the first fourth pressed will be much stronger than first fourth displaced; and from this fact, when we come to the last fourth, we have a much better chance to clean out all that is left by pressing than by displacing, as the action of the press is much more definite or positive than percolation.* In what little conversation I have recently had

*[This *appears* to be mere assertion, as does much that the author states in reference to the exhaustion of drugs by pressure, in the absence of actual results. What we want, and what we have always had, when any great innovation, like percolation, has been introduced, is a tabular statement of actual careful trials, made in a truthful spirit. Let us have the solid contents of each fourth compared with the same by percolation. Our own *opinion*, in the absence of actual comparative trial, is that the first percolate will be denser than the first pressed liquor, whatever may be true

with druggists, I find some of them are prejudiced against pressing, and very much in favor of percolation; this comes from the fact that they have worked with good displacers, but with very inferior presses. The press I have been using has all the latest and best improvements, and is so arranged that the substance being pressed is readily removed and readily parts with its liquid whilst under pressure, while most presses used by druggists are very weak and poorly arranged affairs.

For making solid extracts, a most perfect preparation and a stronger extract can be made by evaporating a fluid extract made by my process than can be made by any other plan. Druggists adopting my plan for making fluid extracts can always make a solid extract at very short notice by evaporating the fluid extract to a solid, and have a most reliable article, if the very small amount of evaporation necessary is carefully conducted. Solid extracts made in this way will be stronger than made in any other way, because of the very small amount of menstruum used; the inert parts of the drug are not so readily dissolved out as the medicinal parts are, especially if the solvent or menstruum used be exactly right. When a revision of the Pharmacopœia is made, I would suggest to the revisors that, as far as practicable, for the sake of uniformity, the fluid extracts be made without sugar, except in cases where a small quantity could be advantageously used as a solvent or assistant solvent, and that they be made with the lowest amount of alcohol consistent with preservation, using alkali, glycerine, sugar or any other substances that would assist in dissolving and holding in solution the medical

of the subsequent portions, because the first stratum of liquid that descends in a well arranged percolator exerts its action consecutively upon each stratum of the drug, until it becomes saturated. We all have percolators, but very few of us presses of the capacity necessary to work out the problem. It is therefore highly proper that the author of the process himself, furnished as he is with the means, should make these experimental trials, and offer them as the basis of his opinions, for others to substantiate or refute,—and not come forward with mere assertions, without, so far as we can judge, any therapeutic trials, or any analyses or evaporations to decide the actual merits of the process.

The reception of this paper just as we were going to press, prevents our accompanying it by a more detailed and explicit commentary.—Ed. Am. J. Ph.]

virtue of the drug, the same solvent being necessary to hold in solution that is required to properly extract the virtues, and vice versa, that is to say, just the same solvent is necessary to dissolve out the virtues of a drug that is required to hold the same permanently in solution. For the small quantities wanted by retail druggists, a powerful press of small dimensions can be made for about one hundred dollars, capable of fully extracting by my process the full virtues of any drug. So if the revisors of the Pharmacopœia should on investigation satisfy themselves of the superiority of my plan over all others, there would be no reason why pharmaceutists should not be expected to incur so reasonable an amount of expense for the sake of carrying out properly the best process for making so valuable a class of preparations, as I now propose to grant to any druggist or apothecary individual rights to use my process on agreeing to pay a small fee on each pound of the fluid extract when made. There is no obstacle in the way of its general adoption, except the mere cost of a suitable press, which is now, for moderate quantities, two hundred and twenty-five dollars, and for small quantities the cost will probably be about one hundred dollars. In applying this process, when I claim that it is entirely practicable for all the different drugs in the list of Materia Medica, I, of course, would have it understood that the solvent or menstruum must in all cases be the proper one; and that is a matter that the operator must understand. If operating on substances for which there is no standard authority, the process is perfection; but, of course, if the menstruum be not the proper one according to the nature of the drug, the preparation will not be perfect; but if the solvent used be capable of holding the virtues of the drug in solution, there can be no question about its ability to dissolve it out by my mode of applying it, while the same liquid merely running through will not and cannot be expected to so thoroughly and quickly dissolve out the virtues, particularly if any of the particles of the drug happen to be a little too coarse, which, under the action of powerful pressure, will have the virtues removed from the centre of the particle that would be passed by or missed by a percolating liquid not under pressure.

ON THE ADULTERATION OF SAFFRON WITH THE STAMENS OF CROCUS.

By Robert Bentley, F.L.S., M.R.C.S. Eng.,
(Professor of Materia Medica and Botany to the Pharmaceutical Society of Great Britain, etc.)

Saffron must necessarily be dear, in consequence of so small a portion of the flower of the plant (*Crocus sativus*) from which it is derived, entering into its composition. It has been computed that upwards of 60,000 flowers are required to form a pound of saffron. For this cause, also, saffron has always been liable to frequent and great adulteration. The substances that have been most frequently employed for its adulteration are the florets of the safflower plant (*Carthamus tinctorius*,) and those of the com mon garden marigold (*Calendula officinalis*.) The former plant, indeed, has received the name of *bastard saffron;* and according

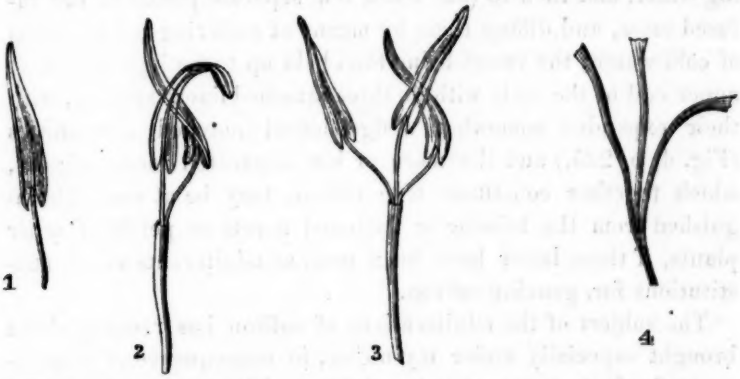

Fig. 1. Stamen of Crocus, somewhat enlarged in order to exhibit more distinctly its characteristics.

Fig. 2. A part of the tubular portion of the perianth of Crocus, bearing two stamens.

Fig. 3. The same as Fig. 2, except that three stamens are inserted on the inside of the tubular portion.

Fig. 4. The upper end of the style, with the three stigmas, of *Crocus sativus*, which together form genuine saffron.

to Pereira, and his observations have recently been confirmed by myself, the so-called Cake Saffron of the shops, which was formerly obtained by submitting the ordinary hay or officinal saffron to pressure, is now commonly prepared from safflower florets, made with mucilage into a kind of paste, which is afterwards rolled out into cakes. Other adulterations of saffron that have

been more especially noticed are, the petals of soapwort (*Saponaria officinalis*,) the flowers of arnica (*Arnica montana*,) and the flowers of a species of *Pulicaria*. Fibres of smoked beef, it is said, have also been employed for adulterating saffron, and other foreign substances have been likewise occasionally detected in different specimens of this drug. Saffron, again, from which the color has been extracted has been used to adulterate genuine saffron. The intermixture with, or substitution of, the florets or petals of other plants with the genuine drug may be readily detected in many ways, but the plan commonly adopted is by examining the suspected portion, after maceration in boiling water, with a magnifying glass. A much simpler and better plan is to macerate some of the suspected saffron for a few minutes in boiling water, and then to take out a few separate pieces of the infused mass, and diffuse them by means of a stirring-rod in a glass of cold water; the vessel being then held up to the light, the short upper end of the style with its three attached linear stigmas, with their expanded somewhat wedge-shaped notched extremities (Fig. 4, p. 225,) and the more or less separated loose stigmas, which together constitute true saffron, may be at once distinguished from the tubular or flattened florets or petals of other plants, if these latter have been used as adulterants of, or substitutions for, genuine saffron.

The subject of the adulterations of saffron has recently been brought especially under my notice, in consequence of a specimen of saffron supposed to be adulterated having been forwarded to this Society for examination from a wholesale house in the City. From inquiries made afterwards, I found that a sample of this saffron was offered for sale by two Spaniards, who came furnished with a recommendation from a gentleman well known to the members of the firm; and it was stated that a quantity of it could be furnished if required. Upon examination, the saffron was refused by the firm, as it did not answer to their tests of true saffron, and a sample was afterwards forwarded to this Society for further investigation.*

* I shall be greatly obliged to any chemist, who, when he has reason to suspect the adulteration of any drug, but cannot satisfy himself upon the adulterant, if he will forward a specimen to me for further examination. In this way, old adulterations may be again exposed, and new ones detected and brought before the public.

Upon a superficial examination this specimen of saffron presented a considerable resemblance to genuine saffron in general appearance, color and odor. Upon a closer inspection, the odor was found to be much less penetrating and aromatic than that of true saffron, and to have added to it something of a different and peculiar nature; and the mass was seen to be principally composed of somewhat cylindrical twisted compressible bodies, with a few firmer thread-like ones intermixed, instead of being wholly composed of firm thread-like bodies, as would have been the case with a specimen of genuine saffron. In other words, the present specimen of saffron was found to be less fibrous or filamentous in appearance than that of genuine saffron.

Upon infusing a portion of the specimen in warm water, and comparing the appearances which it then presented with some true saffron exposed to similar conditions, the difference between the two was most striking, and could not but have been evident to any ordinary observer. Thus, in the case of the genuine saffron, the color was seen to be but slowly communicated to the water, which gradually assumed a deep orange-yellow color, and remained perfectly clear and transparent; and when the infused mass was stirred up and diffused through the liquid, the peculiar appearance and structure of the styles and stigmas constituting genuine saffron, as already noticed, (Fig. 4,) was clearly exhibited. With the other specimen, however, the color was almost immediately taken up by the water, which almost immediately assumed a deep orange-yellow color, and also presented a turbid appearance from the diffusion through it of small granules. These granules were also seen on the side of the glass vessel in which the infusion had been made; and although many of them ultimately subsided to the bottom of the vessel, many remained in suspension, so that the infusion, however long kept, never became clear. Upon examining the infused substance it was seen to be principally composed of a closely-adhering mass of very pale-yellow flabby, more or less flattened, and somewhat cylindrical twisted bodies, with a few thread-like deep orange-yellow ones intermixed. The appearance of this mass was most striking, and would in itself have led to the detection of the adulteration. It was seen at once,

from the shape and color of the filamentous portions, that they were genuine saffron, but the question now arose as to the nature of the other and greater portion of the mass. To determine this, I at first examined some of the separated pieces of the mass with a magnifying glass, and satisfied myself directly that they were not the florets or petals of any of the plants which had been hitherto alluded to as having been employed to adulterate saffron; neither were they the similar parts of any other plants, nor any substances hitherto described as adulterants of saffron; but, instead of any of these, I found bodies of a pale yellow color, half an inch or more in length, attached below to a firmer and nearly cylindrical stalk (Fig. 1, p. 225,) which latter was also, in some cases, adherent to a flattened portion of a petal or a tubular body. I also found a few larger pieces of the colored divisions of the perianth intermixed with the above. I concluded that the bodies under examination must be stamens, but in order to satisfy myself more completely on this point, I took a few of them on the end of a glass rod, and diffused them in a glass of cold water; that they were then the stamens of a Crocus there could be no doubt, for I had before me open cellular bodies half an inch or more in length, with a somewhat pointed apex and an arrow-shaped base (Fig. 1, p. 225.) Each of these was also seen to be attached below to a solid nearly cylindrical thread-like shorter stalk; and this latter was, in some instances, also adherent to a portion of a petal. Upon more complete examination in the same way, I found that some of the separated pieces were two or more inches in length, and consisted of a tubular portion below, from the inside of which there arose above three filaments, bearing at their extremities arrow-shaped (sagittate) anthers (Fig. 3, p. 225;) in fact, here was the tubular portion of the flower of a Crocus, with the three stamens found in it as in all the other plants of the Natural Order to which it belonged, attached. I could also readily make out by the unassisted eye, although still better by the aid of a small magnifier, the mode of attachment of the anthers to the filaments, and the manner in which they had dehisced. As the number of stamens and the attachment and dehiscence of the anthers is very marked in the order

Iridaceæ, to which the genus *Crocus* belongs, I had thus a further confirmation, if any were needed, of the adulterant being the stamens of a Crocus, which had been previously twisted so as to alter their natural form and characters, and thus render them more difficult of detection. In some cases I found similar tubular portions bearing two stamens (Fig. 2, p. 225,) the third stamen having become detached.

A very ready way of detecting this adulteration of saffron with stamens is to take a small portion of the suspected specimen and diffuse it in a glass of cold water by means of a stirring-rod for about a minute, the water will become immediately colored, and if the stirring be now discontinued the whole mass will rise to the surface of the fluid, and the genuine orange-yellow-colored saffron will be readily distinguished from the pale-yellow-colored twisted stamens. The proportion of adulteration may in this manner be readily estimated. If, instead of using cold water, boiling water be employed in the above experiment, I find a somewhat different result; thus, if the proportion of stamens in the specimen be large, as in the one now being described, the whole infused mass will rise towards the surface of the water in the manner just mentioned; but if there be only a small admixture of stamens, the genuine saffron will sink towards the bottom of the fluid, and the stamens alone rise and float on its surface. In the former case, the true saffron, being in small quantity, appears to be so entangled with the stamens, that it is carried upwards with them.

Having ascertained that the specimen of saffron was adulterated extensively with the stamens of a Crocus, I had an explanation of the cause of the turbid appearance of the solution formed by infusing some of it in water, as already noticed, and of the nature of the suspended granules. These granules must be those of the pollen which had been washed out of the anthers by the water in which the stamens had been infused; and, upon examining them by the microscope, I was able to prove that my opinions were correct. The best way to see these granules is to dip a glass rod into the turbid solution formed by macerating the adulterated saffron in water, and then drop the adherent fluid on a piece of glass. This is to be covered with

another piece of thin glass in the ordinary way, and placed on the stage of the microscope; the pollen granules will then be observed to be perfect globes, of a yellow color and glistening character. Mixed with the pollen a small portion of some angular earthy fragments will also be noticed. The proportion of this earthy matter, however, is not great, and hence its presence is doubtless accidental, and not an intentional admixture with the saffron, as is sometimes the case with sand, etc.

That the stamens thus used for adulterating saffron were those of the Saffron Crocus (*Crocus sativus*) I have every reason to believe, from minute examination of their form and appearance, and from comparison with those of other species of crocus; indeed, there would be no inducement to those by whom such an adulteration had been performed to throw the stamens of the saffron crocus away, and collect the corresponding parts of other species; it would be far easier to pluck the stamens and the parts constituting genuine saffron from the same flower at the same time, and mix them together. Moreover, the common species of crocus flower in spring, while the saffron crocus flowers in the autumn months; and hence, it would be still less probable that the stamens would be gathered from one species at one season and the stigmas from another species at a different period, and the two be then mixed together. It is possible, certainly, that the collector of the saffron might have had nothing to do with the adulteration, but that the purchaser of the genuine drug had afterwards mixed with it the stamens of another species of crocus, but having carefully examined the stamens in the present specimen, and compared them at the British Museum and Kew with those of the saffron and spring crocus, etc., I think there can be no doubt but that both the stigmas and stamens had been gathered at the same time and from the same plant, namely, from the *Crocus sativus*, and then mixed by the collector.

Having now proved that the specimen of saffron under examination was extensively adulterated, being composed, as nearly as I could ascertain, of about one-third genuine saffron, and the remaining two-thirds principally of twisted stamens, and to a slight extent of parts of the adherent or separated col-

ored divisions of the perianth, and of the tubular portions of the flower, another question now arose. The tubular portion of the flower of the saffron crocus, in its natural condition, is nearly white, while the anthers are pale yellow; but here the whole of the specimen had a nearly uniform orange-yellow color. This is, I think, readily to be explained. The stamens, etc., had been dyed with some orange-yellow-colored solution—probably the whole specimen together—by which a nearly uniform deep orange-yellow color had been given to it. That such was the case seems clear from a comparison of the different appearances produced on a mass of this saffron directly after its infusion in warm or cold water with that of genuine saffron under the same conditions; thus, in the former case, as already noticed, the orange-yellow color of the greater portion is immediately communicated to the water, and the anthers left of their natural pale yellow color, while the genuine saffron mixed with it retains the principal portion of its orange-color for some time afterwards; while in the latter, or true saffron, the whole retains its orange-yellow color for a long period. The nature of the coloring matter thus used for dyeing the saffron is more difficult to determine, and I am as yet by no means satisfied upon this point. It may have been a very strong solution of genuine saffron, and the similarity of the color produced by infusing in water this spurious saffron and that of genuine saffron would appear strongly to confirm this view; but when we remember how little genuine saffron is contained in it, yet the depth of color as shown by infusion and by its dilution with water, is scarcely in any degree less than that of genuine saffron, this becomes more doubtful. This, however, is a matter of comparatively trifling importance, and may be left for future investigation.

This adulteration of saffron with the stamens of crocus has never been noticed previously in this country; no allusion having been made to it in the works of Pereira, Royle, Christison, or other of our authorities on materia medica; neither had it, so far as I knew when the above was written, been noticed by foreign writers on pharmacology, but I have since had my attention directed to a note on a similar kind of adulteration by

Professor Guibourt, which had occurred in France. I do not, of course, mean to say that the stamens of Crocus have not been before noticed in specimens of saffron, for occasionally a few anthers may be detected in them; but as these are found of their natural pale-yellow color, and untwisted, no attempt having been made to dye and otherwise alter their appearance, their presence is evidently accidental, and due to carelessness in collecting saffron.

Since the above was written, I have examined various specimens of saffron obtained from different quarters, in two of which I have detected the same fraudulent admixture of stamens with the genuine drug. In both these instances, however, the admixture of stamens with the genuine saffron occurred to a far less extent than in the specimen I have particularly described in this paper. One of these specimens was certainly twenty years old, and was marked "adulterated saffron;" and the other was a specimen of saffron exhibited as genuine at the Great International Exhibition held in London in 1862. Such being the result of my examination in so short a period, I think it will soon be found that the adulteration of saffron with the stamens, etc., of Crocus is by no means rare in this country and elsewhere.—*London Pharm Jour., March*, 1866.

NEW FLUID FOR PRESERVING NATURAL HISTORY SPECIMENS.

By A. E. Verrill.

In consequence of the high price of alcohol, a series of experiments were undertaken by me last year, with the view of finding a substitute for it in preserving the soft parts of animals. Among the various solutions and liquids tested were nearly all that have ever been recommended, besides many new ones. Chloride of zinc, carbolic acid, glycerin, chloride of calcium, acetate of alumina, arsenious acid, Goadby's solutions, and various combinations of these and other preparations were carefully tried, and the results made comparative by placing the same kind of objects in each, at the same time. Although each of these, under certain circumstances, have more or less preservative quali-

ties, none of them were found satisfactory, especially when the *color* and *form* of the specimen are required to be preserved as well as its structure.

As a test for the preservation of color, the larvæ of the tomato-worm (*Sphinx quadrimaculata*) was used. These larvæ are difficult of preservation with the natural form and color, nearly always turning dark brown and contracting badly in alcohol and most other preparations.

As a result of these experiments the following solutions were found highly satisfactory in all respects when properly used. By their use the larvæ and recent pupæ of the tomato-worm were preserved and still retain their delicate green colors, together with their natural form and translucent appearance, while the internal organs are fully preserved. Fishes, mollusks, various insects, worms, and leaves of plants have also been preserved with perfect success and far better than can be done with alcohol. In the case of mollusks, especially, the preparations are very beautiful, retaining the delicate semi-transparent appearance of the membranes nearly as in life, with but little contraction. Another great advantage is the extreme simplicity and cheapness of the solution.

To use this fluid I prepare first the following stock solution, which may be kept in wooden barrels, or casks, and labeled:

SOLUTION A. I.

Rock salt, ...	40 oz.
Nitre (nitrate of potassa), ...	4 oz.
Soft water, ...	1 gal.

This is the final solution in which all invertebrate animals must be preserved. A solution with double the amount of water may be kept if desirable, and called A. II. Another with three gallons of water will be A. III.

In the preliminary treatment of specimens the following solution is *temporarily* employed, and is designed to preserve the object while becoming gradually saturated with the saline matter, for in no case should the specimen be put into the full strength of solution A. I., for it would rapidly harden and contract the external parts and thus prevent access to the interior. Even with alcohol it is far better to place the object for a time in weak

spirits and then transfer successively to stronger, and for some objects, as Medusæ, no other treatment will succeed.

SOLUTION B. I.

Soft water, ...	1 gallon.
Solution A. I, ...	1 qt.
Arseniate of potassa, ...	1 oz.

Another solution with double the amount of water may be made if desired, and called solution B. II.

To preserve animals with these solutions they are, if insects or marine invertebrates, ordinarily placed first in solution B. I, but if the weather be cool it would be better in many cases to employ first B. II, and in the case of all marine animals washing first in fresh water is desirable, though not essential. If the specimens rise to the surface they should be kept under by mechanical means. After remaining for several hours, or a day, varying according to its size and the weather, in the B. I. solution it may be transferred to A. III, and then successively to A. II, and A. I, and when thus fully preserved it may be transferred to a fresh portion of the last solution, which has been filtered clear and bright, and put up in a cabinet, when no further change will be necessary if the bottle or other vessel be properly secured to prevent the escape of the fluid by crystallization around the opening. To prevent this the stopper, whether of cork or glass, together with the neck of the bottle or jar, may be covered with a solution of paraffine or wax in turpentine or benzole, which should be applied only when the surfaces are quite dry and clean. The length of time that any specimen should remain in each of the solutions is usually indicated by their sinking to the bottom when saturated by it. In general the more gradually this saturation with the saline matter takes place the less the tissues contract or change in appearance. In many cases, however, fewer changes than indicated above will be effectual. I have in some cases succeeded well with but two solutions below A. I. For vertebrates, except fishes, the solution A. II. will usually be found strong enough for permanent preservation, especially when the object is small or dissected. If the entire animal be preserved, when larger than two pounds in weight, it should be injected with the fluids, especially B. I. and the final

A. I. or II, or an incision may be made in one side of the abdomen in vertebrates, or under the carapex of crabs, &c., to admit the fluids more freely. In preserving the animals of large univalve shells an opening should be made through the shell at or near the tip of the spire. Mammals, birds and reptiles, should be placed first in solution B. II. to obtain the best results. In cases where the use of the B. fluids would be objectionable, on account of their highly poisonous nature, a fourth dilution of solution A. I, corresponding in strength with B. I, but without the arseniate of potassa, may be substituted, and in many cases will do nearly as well, if the whether be not very hot, but the specimens in this case should be carefully watched and transferred to the stronger solutions as soon as possible, so as to avoid incipient decomposition while in the first fluids.—*Silliman's Journal.*

New Haven, Feb. 12, 1866.

ON BORAX IN CALIFORNIA.

By Prof. J. D. Whitney.

Some explorations have been made around the lower end of Clear Lake, more particularly for the purpose of getting an idea of the very interesting locality of borax, which is found in this region.

Clear Lake is about sixty-five miles north-west of Suisun Bay, and about thirty-six miles from the Pacific. It is believed to be about twenty-five miles long, but has never been surveyed, so that its shape and size are not accurately known. * * *

At the angle where the narrow part of the lake opens out to the west is a high mountain, which comes down with a precipitous front to the water, and which is supposed to be about 2,500 feet above the lake level. It is called the "Uncle Sam Mountain," and, as seen from the opposite side of the lake, it appears to be made up of a closely-folded synclinal mass, probably of somewhat metamorphic Cretaceous sandstones. On the south-west side, and to the south-east, volcanic materials and rocks occupy the surface, as is well seen in a crater-like depression on the south-west side of the narrow arm of the lake, called "Thurston's Lake," which is partly covered by water, and surrounded on all sides by high cliffs of volcanic rocks, appearing as if it might

have been one of the vents from which the eruptive matter, obsidian, ashes and pumice, so abundant in this region, were ejected. On the eastern side of the narrow arm of Clear Lake, nearly opposite to, and about four miles distant from, Thurston's Lake, is a large accumulation of volcanic materials, with much obsidian and pumice. In fact, all through the Chain of the Coast Ranges in this direction, down Grizzly Canon to Bear Valley, on the trail to Colusi, there are hot springs and the remains of Solfatara action, indicating strongly a cross-fracture in this region, through which the volcanic agencies have made themselves perceptible, and which probably connects on the south-west with the Geysers, thus forming a line of volcanic action nearly if not quite across the chain.

Among the evidences of the former working of volcanic forces in this region, there is nothing more interesting and remarkable than the so-called "Borax Lake" and its vicinity. This lake occupies a depression on the east side of the narrow arm of Clear Lake, from which it is separated by a low ridge of volcanic materials, lying loosely heaped together, and consisting of scoriæ, obsidian and pumice. The Borax Lake is of variable dimensions, according to the season of the year and the comparative dryness of the season. When examined, (September, 1863,) the water occupied an area about 4,000 feet long, and 1,800 feet wide in the widest place, and its shape was irregularly oval, its longer axis being turned in the direction of east and west, magnetic; it has once extended nearly twice as far to the south-east, as the ground is hardly raised above its present level in that direction for nearly a mile. The lake is said to have been entirely dry during the summer before the great rains of 1861–62. In 1863, the water was about three feet deep.

The existence of this lake was first made known to the world by Dr. J. A. Veatch, who examined it in September, 1856, and detected the presence of borax in its waters; but it was not until some months afterwards that the existence of a large bed of crystals of this valuable material in the bottom of the lake was discovered. The land about here has been located by the "California Borax Company," the agents of which have caused explorations to be made, have had the waters carefully analyzed,

and were, in 1864, preparing to manufacture borax on a large scale.

The water collected from the Borax Lake in September, 1863, as analyzed by G. E. Moore, contained 2401·56 grains of solid matter to the gallon, of which about one-half was common salt, one quarter carbonate of soda, and the remainder chiefly borate of soda, there being 281·48 grains of the anhydrous biborate, equal to 535·08 of crystallized borax to the gallon. Traces of iodides and bromides were also detected. A sample of water taken from the interior of a coffer-dam sunk in the middle of the lake, and which had been allowed to fill by percolation from the bottom upward, was found to be more concentrated, yielding 3573·46 grains of solid matter to the gallon; but it contained nearly the same ingredients, and in the same proportions, as the water of the lake itself. The borax, being the least soluble substance contained in any notable quantity in the water, has in process of time crystallized out to a considerable extent, and now exists in the bottom of the lake in the form of distinct crystals, which are of all sizes, from microscopic dimensions up to two or three inches across. These crystals form a layer immediately under the water, intermixed with blue mud of varying thickness; as observed in the coffer-dam sunk in 1863, the layer of crystals was about eighteen inches thick, and beneath it was mud without crystals. The thickness, however, of the deposit is undoubtedly very variable, and there are, in places, several layers of them separated by beds of clay or mud. It is believed, by those who have examined the bottom of the lake, that several million pounds of borax may be obtained from it by means of movable coffer-dams, at a moderate expense, and so as to yield a handsome profit to those engaged in the enterprize. How much of a supply of water could be obtained by boring, and what its quality would be, can hardly be settled in any other way than by actual experiment.

Lying about a mile beyond the ridge which borders the Borax Lake on the north-east, and at the foot of a shorter arm of Clear Lake, which extends off to the south-east parallel with the longer one, is an interesting locality where solfatara action is still going on, and where a large amount of sulphur has accu-

mulated. This is called the "Sulphur Banks." It consists of a much decomposed volcanic rock, fissured in innumerable places, through which fissures steam and gas are constantly issuing, and all over and through which large quantities of sulphur have been deposited, so as to give the mass, from a little distance, the appearance of being entirely composed of this material. Into some of these cavities a pole may be inserted for several feet, and they are often lined with fine crystallizations and stalactites of sulphur. No doubt, a large quantity of this material could be obtained here, and the time will probably come when it will be made available. It is the largest deposit which we have seen in the State, covering several acres of ground; but to ascertain its value and determine the quantity of pure sulphur it contains, it would have to be dug into at various points.

Near the sulphur bank, just at the edge of the lake, is a hot spring, of which the outlet is, even at low water, partly beneath the lake, so that the amount which flows from it cannot be ascertained without some expenditure, to keep out the surrounding water. The flow of this spring seems to be quite variable at different seasons, and probably the amount of material it holds in solution is far from constant. Dr. Veatch found the area over which hot water was percolating through the sand to be 150 by 75 feet in dimensions; at the time of our visit, it was much less; nor was the estimated yield anything like as great as he made it, namely, three hundred gallons per minute.

The water of this spring, as analyzed by Mr. Moore, is found to be of a remarkable character; his analysis is subjoined.

	Grains in one gallon.
Chloride of potassium	trace.
Chloride of sodium	84·62
Iodide of magnesium	·09
Bromide of magnesium	trace.
Bicarbonate of soda	76·96
Bicarbonate of ammonia	107·76
Biborate of soda	103·29
Sulphate of lime	trace.
Alumina	1·26
Carbonic acid (free)	36·37
Silicic acid	8·23
Matters volatile at a red heat	65·77
	484·35

In this table, the constituents are necessarily calculated as anhydrous salts; the biborate of soda, however, contains about 47 per cent. of water when crystallized, and the 103·29 grains given above correspond to 195·35 of crystallized borax. The most extraordinary feature in the above analysis is the very large amount of ammoniacal salts shown to be present in this water, in this respect exceeding any natural spring water which has ever been analyzed. Mr. Moore thinks that, as in the case of the boracic acid waters of Tuscany, this ammoniacal salt may be separated and made available for economical purposes. This locality is worthy of a most careful examination to ascertain how considerable a flow of water can be depended on.—*From Prof. J. D. Whitney's Geological Survey of California*, vol. i., p. 96.

Additional note.—The San Francisco papers received last Saturday state, in regard to the California borax: During the year, they have supplied the local demand of thirty to forty tons and shipped two hundred tons to New York. The borax is collected from the mud at the bottom of the lake, during the dry season, the yield last season averaging about two and a half tons per day. The "crude borax" thus obtained is "so pure that the Mint and assayers of the city use the crude article in preference to the refined brought from abroad."—*Silliman's Journal, March*, 1866, from *Weekly Bulletin, Jan. 13th.*

WHY DO BEES WORK IN THE DARK.

By Charles Tomlinson, F.C.S.

About two years ago a paragraph appeared in the *Chemical News* (April 30, 1864,) and went the round of the papers, under the title of "Why Bees Work in the Dark," in which it was stated (1) "that the change of honey from a clear yellow syrup to a solid mass is a photographic action; that the same agent which alters the molecular arrangement of the iodide of silver on the excited collodion plate, and determines the formation of camphor and iodine crystals in a bottle causes the syrupy honey to assume a crystalline form." In proof of this, M. Scheibler enclosed honey in stoppered flasks, some of which were kept in

the dark while others were exposed to the light, when it was found that the sunned portion rapidly crystallized, while the honey kept in the dark remained perfectly liquid. (2) "We now see," he says, "why bees are so careful to work in perfect darkness, and why they are so careful to obscure the glass windows which are sometimes placed in their hives. The existence of their young depends on the liquidity of the saccharine food presented to them, and if light were allowed access to this the syrup would gradually acquire a more or less solid consistency; it would seal up the cells, and in all probability prove fatal to the inmates of the hives."

While I was on a visit to a village on the Dorsetshire coast at the end of July, 1864, some new combs were brought in containing virgin honey, when it occurred to me to test the observation on which the above theory is founded, and the more so since the remark that "light determines the formation of camphor and iodine crystals in a bottle," I knew to be erroneous. Accordingly, I collected a small quantity of this new honey in two bottles, and wrapped one of them in several folds of stout paper and left the other exposed. On my return to town early in August, I placed the bottles in an east-window, where they remained many months exposed to the cold of winter and the sun of spring, with the temperature often below freezing point, and on warm days above 70° Fahr. The honey in both bottles remained quite fluid, and the only change was the deposit in each bottle of a few bright crystalline grains.

A still more perfect experiment was made in July, 1865. Being in the same Dorsetshire village I procured some virgin comb that had never seen the light, squeezed it gently through clean linen, and received the stream of pure, limpid honey into two eight-ounce white glass bottles. When these were nearly filled the stoppers were inserted, tied over, and the bottles labelled. One was wrapped up in opaque paper, and the other was, a few days afterwards, exposed to the light on a window frame, where it has remained ever since, exposed to the direct sunshine of summer, and to the cold of winter; but the honey, whether exposed to the light or covered, remains perfectly limpid after about eight months.

A bottle of honey from Rosenthal, in Switzerland, was procured from Messrs. Fortnum and Mason. This, they said, was three years old and improved by keeping. It was in a bottle of light-green glass, and had been in their shop window for a long time. I transferred a portion of this honey to a white glass bottle, and it has been exposed to the light for about ten months, and is still (February, 1866) quite fluid.

Virgin honey from Bromborough Pool, near Birkenhead, exposed to the light during many months, remains quite fluid; but old honey—*i.e.*, gathered from combs of the second year, whether exposed to the light or not, soon became solid. So also honey from near Dunstable, gathered from a new comb, became solid, contrary to the above experience, whether exposed to the light or not.

These facts sufficiently prove that "the sunned portions" of virgin honey do not always "rapidly crystallize."

The specimens of new honey, then, had, with one exception, not solidified after many months' exposure. I endeavoured to bring some Dorsetshire honey into the candied state by placing it in a capsule over sulphuric acid under the receiver of an air pump. The honey thus operated on was taken from a jar prepared in the usual way, by steaming the combs; it was darker in color than that exposed to the light, but still quite fluid. It was kept *in vacuo* about a fortnight; the pump was worked two or three times a day, and at each working there was a disengagement of air bubbles, as if a slight fermentation had been going on in the honey, but it did not candy. The capsule was now placed on the window ledge by the side of the bottles containing the virgin honey. It was left exposed to the air during some weeks, in which time it not only did not candy, but increased in bulk to overflowing, thus proving the presence of some deliquescent material.

Acting on this idea, I weighed out 100 grain portions of honey from different sources into watch glasses, and exposed them on the window-ledge. They all absorbed moisture more or less, and the absorption was greatest in damp weather, but in very unequal proportions; for while Normandy honey absorbed 8½ grains of moisture, Minorca honey absorbed only 3½ grains, and when the

former weighed 103½ grains the latter had actually lost weight, the 100 grains being only 99½ grains. The Dorsetshire honey was by no means so absorptive as the Rosenthal, but in all four cases that were tried there was absorption of moisture during damp weather, and loss of moisture during dry; showing, in fact, the presence, in greater or less quantity, of deliquescent salts in the honey.

Remembering the fondness of bees for salt water, it seemed probable that the difference between the Dorsetshire honey and the Hertfordshire honey might arise from the fact that the one contained a minute proportion of salt, or of the salts of sea water, which was absent in the other.

The fondness of bees for salt has long been a puzzle to entomologists. Dr. Bevan, in his work on "The Honey Bee," says:—"I keep a constant supply of salt and water (about a teaspoonful to a pint) near my apiary, in a shallow dish, covering the bottom with small pebbles, and find it thronged with bees from early noon to late in the evening. About this period (*i.e.*, the spring) the quantity they consume is considerable, but afterwards they seem indifferent to it." In the volume on bees contained in Sir William Jardine's "Naturalists' Library," it is stated, p. 49, that "bees have recourse in spring, but generally speaking in spring only, to dunghills and stagnant marshes for the sake of the salts with which they are impregnated, and which their instinct teaches them are advantageous to their health after their long winter confinement."

It seemed more probable that bees collect small portions of salt for the purpose of keeping their honey fluid than for the purposes of medicine, as suggested by the last quotation. To test this, two portions of 120 grs. each of the candied Hertfordshire honey were scraped from a spatula upon the edges of two evaporating dishes; one specimen was sprinkled with about 2 grs. weight of marine salt, such as are used for making artificial sea water. In the course of a few hours this honey showed signs of liquefaction, although the weather was cold; and in the course of two or three days it had run down into the dish in a liquid form, so that it could be poured. The honey in the other dish continued for weeks adhering to the edge, showing much less decided signs of liquefaction.

The examination of various specimens of honey did not confirm this view, but it led to the detection of a variety of salts, among which lime was particularly abundant, especially in honey from inland places. Potash was also found in considerable quantity, and this would tend to make the honey deliquescent. As far as my examination has extended, nothing seems to explain why some varieties of new honey become candied sooner than others. The presence of lime does not seem to explain anything, except that bees may introduce a good deal of filth into their honey; for the lime was probably gathered in the form of nitrate, which is an abundant salt in water from dunghills, stagnant ponds, and bogs, and wherever there is decaying animal matter; so that the bees drinking at such places must be a happy thought for honey eaters. But one practical suggestion arises from this examination—namely, supply your bees with salt and water, and they will probably not frequent dunghills. In places near the sea bees can procure common salt and the salts of sea water for themselves; and it will be remembered that the most celebrated honeys of the world, such as those of Mount Hymettus, Mount Ida, Mahon, Cuba, the Bermudas, &c., are all fluid, and even syrupy, and that all these places are within easy access of the sea.

I asked my friend Mr. Rodwell to examine two specimens of honey, both inland—one from Switzerland and the other from Hertfordshire. He found in the Swiss honey, iron, alumina, and phosphates, together with lime, magnesia and potash; and in the Hertfordshire honey all the above ingredients, together with ammonia. As far as the results of the examination of these and the other specimens are concerned, it would seem that bees are extensive collectors, picking up all sorts of stray materials for the purpose of making up their tale of honey. Whether there is any dishonesty in this on the part of the workers, whether these various salts serve some purpose not yet determined, or whether they get accidentally into various kinds of dirty water which the bees drink, we cannot say. At any rate, the fact is very curious that such a variety of salts should be found in honey. It is most probable that honey from other localities would show a similar varied constitution of the ash.

Honey has been regarded by chemists as a solution, more or less concentrated and aromatized, of a concrete in a liquid sugar; but that the climate, the season, the temperature, the kinds of plants on which the bees pasture, give rise to the great differences noticed in the honey of different localities. Some kinds contain only a small proportion of the concrete sugar; others so much as to be nearly solid. The color and aroma are said to depend on the plants, but in wet years or in moist climates and in marshy places, the honey is more liquid, and remains so for a longer time.

Honey is nearly always acid, and the presence of acids tends to keep it fluid, of alkalies to turn it brown. The honey from marshy districts is said to be brown, and the taste not pleasant.

The liquid sugar of honey is said to consist of $C_{12}H_9O_9 + 3HO$, and the solid portion or glucose of $C_{12}H_9O_9 + 5HO$; so that the change from the liquid to the concrete form arises from the combination of two atoms of water. In such cases the 2HO must be taken from another portion of the same honey—that is, the elements are simply re-arranged; for if the change were, as stated in some books on chemistry, due to time and the appropriation of two atoms of water from the air, we should have $C_{12}H_{12}O_{12} = 72 + 12 + 96 = 180$ lbs. of fluid honey, becoming $C_{12}H_{14}O_{14}$, or $72 + 14 + 112 = 198$ lbs. of solid honey—an increase of 10 per cent. in weight, which cannot take place when liquid honey in sealed bottles becomes candied. My experiments tend to show that the absorption of water by exposure renders the honey more liquid, not more solid. The change in the honey may be a molecular one, resembling in some respects that which takes place in barley sugar when kept some time either in the light or in the dark.

The proportions of the two sugars in honey vary so much as probably to account for most of the differences observable in different specimens. It is said the concrete glucose is more abundant in spring than in autumn, if the year be dry, than if wet, and in countries abounding in labiated and aromatic plants than in others. The liquid portion is more soluble in concentrated alcohol than the solid, and in this way the two can be separated.

Any experiments on this subject must be with virgin honey,

or that drained from the new comb. This, in the Dorsetshire specimen, was colorless and limpid, but when prepared from new and old combs by the action of heat the honey becomes changed, and candies sooner, although a jar of Dorsetshire honey thus prepared at the end of July, 1864, was sufficiently fluid to be poured from the jar in the following March.

But the question still remains unanswered, "Why do bees work in the dark?" In reply to this question from the bees' point of view, it must be remembered that the bees know nothing of the physical property of transparency; they argue that the path by which light enters will also admit their enemies. The poor fly that knocks his head against the pane of glass will never understand why he cannot get through it; and the bee, with all his sagacity, will not appreciate his security under a transparent hive. But it is not true that honey does not solidify in the hive. The volume of the "Naturalists' Library," from which we have already quoted, states (p. 119) that the heat and vapour of the hive are injurious to the honey, and that "in very severe seasons it is sometimes candied."—*London Chem. News, March* 2, 1866.

King's College, London, February 17.

THE ACTIVE PRINCIPLES OF HELLEBORUS.

The physiological experiments hitherto instituted with hellebore and its various preparations, have only been made on animals, and as it appears, up to within a few years ago, with much uncertainty as to the species employed by the experimenters. The older statements probably refer all to Helleborus viridis. Vulpian, Koelliker, Pelikan, and others, assume an immediate tendency to the heart, Schroff also an irritating narcotic action. Marmé and Husemann, who have lately separated several proximate principles of *H. viridus*, *niger* and *fœtidus*, make the subjoined statements with reference to the physiological action of those principles.

The root and lower leaves of the three species named contain originally two non-volatile active principles, of the nature of glucosides, to which the authors have given the names *helleborein* and *helleborin*; in addition *H. fœtidus* probably also contains a

third volatile principle. The two substances named act as poisons on all animals, and, presumptively, on man; while the product of their decomposition by acids are without any effect on the animal organism. The so-called oil of hellebore described by Feneulle and Capron, when freed from those glucosides, may be taken in considerable doses without untoward effects. It is remarkable that the helleborein from the green species is much more active than that of H. niger, and probably of H. fœtidus. This substance shows a characteristic indifference to chemical agents, alkalies, or ferments, but is readily soluble, and for both reasons, easily absorbed, with a decided local action, although not an irritating one on the epidermis; on the other hand, it strongly irritates mucous membranes. The conjunctiva, when it is applied, reddens, swells with enlarged secretion, and, indirectly, enlargement of the pupil. On the mucous membrane of the nasal canal it causes sneezing, but not to the same degree with veratria. The salivary glands are excited by it, not only upon direct application, but also when it enters the general circulation. Small doses produce no effect on the stomach, but when accumulated they cause loss of appetite, nausea, even to emesis, pain, enlarged secretion, and gastro-enteritis. The kidneys likewise experience a stimulating effect, and the female genitalia are also affected. Very small doses act on the heart very much in the manner of digitalin, retarding the circulation, while in large doses it accelerates the same, often to fatal rapidity. There may also exist both gradual paralysis and convulsion.

The other glucoside, helleborin, is less soluble in water, but a more active poison when given in small doses, though less irritating to the mucous membrane. Its action on the tongue is similar to that of aconite. The nervous system is peculiarly affected by this substance. In measure with the dose and the susceptibility of the animal, it caused a greater or less degree of nervous excitement, beginning with accelerated breathing, great unrest, tension and trembling of the muscles, great depression, uncertain movements, then retardation of breathing and pulsation, irritability of the nerves of the periphery, strong enlargement of the pupil, the acoustic nerve insensible, finally almost complete anæsthesia, also strong hyperæmia of the brain and spinal marrow,

and even apoplexia. Otherwise its action is similar to other narcotics.

The very decidedly poisonous properties of H. fœtidus, which contains less of the second glucoside, is most probably due to a volatile principle, together with the true narcotic principle, helleborein.—*Druggists' Circular*, April, 1866, p. 90.

ON CANTHARIDIN.

Mr. Bluhm, (*Pharm. Zeitsch. Z. Russland, II.* 160,) states that the usual methods for the extraction of the active principle of Spanish flies do not yield the whole quantity of it that is present, on account of a portion remaining behind in the form of an insoluble compound. To obtain this portion, he recommends that the powdered flies should be stirred up to a paste with one-third their weight of calcined magnesia and some water, and the mixture then be dried on the water-bath; after which, it should be supersaturated with dilute sulphuric acid, and then repeatedly shaken with ether. The latter extracts the cantharidin with fatty and yellow coloring matter, of which impurities the first is removed by bi-sulphide of carbon, and the last by alcohol. Cantharidin is, however, somewhat soluble in those menstruums. In many respects it acts like an acid, forming compounds with bases:

					Cantharidin.
100 parts by weight of			Alcohol (64° F.)	dissolved,	·03
"	"	"	Bisulphide of Carbon.	"	·06
"	"	"	Ether	"	·11
"	"	"	Benzole	"	·20
"	"	"	Chloroform	"	1·20

This substance is not volatilized when boiled with water. The author uses its form of crystallization as well as that of the magnesia compound to distinguish it, together with its vesicating action. The officinal fly showed ·26 per cent. of the principle, while a species of mylabris, common at the author's place of residence, contained nearly double (half per cent.); *Mylabris Melanura* of the same neighborhood had very little.—*Druggists' Circular, April*, 1866.

THE EMPLOYMENT OF GELATIN INSTEAD OF METAL FOR BOTTLE CAPSULES.

By A. F. Haselden.

[The author introduces his article by an extract relative to the English Patent Office, from "Temple Bar," and then refers to the annoyances to which apothecaries and others have been subjected by suits under the patent laws by the proprietors of Betts' Patent Metallic Capsules, and continues as follows:]

"In the meantime all must commiserate the luckless tradesmen who run the risk of getting entangled in the meshes of Mr. Betts's Chancery web. We do so heartily; and therefore beg to suggest to them a most efficient substitute for the metallic capsule, namely, *gelatine*, applied precisely in the same way as sealing-wax or resin—that is to say, in its melted condition, the top of the bottle being dipped into it. It is obvious that by repeated dippings, after cooling, any thickness of capsule may be effected.

"We must observe, however, that gelatine is too brittle when used alone, but, fortunately, science suggests a ready and effectual 'alloy.' This alloy is *glycerine*, that curious substance of which we may say that it is impossible to decide to what purpose it may *not* be applied. The proportion in which it may be added to the melted gelatine, to give it pliability and toughness, is about one ounce and a half to the pound of the latter, well stirred in. Of course, any color may be given to these capsules, either for ornament or to distinguish readily the various liquors or other preparations. In hot climates, there are voracious insects that attack and eat everything,—to wit, the white ant in China,—and, of course, they are fond of all animal matter, so that the gelatine capsule will be endangered; but here again we are ready with the remedy. Bitter aloes and other repellents may be added to the melted mass, to secure this opportune rival from those tropical plagues, whilst it rescues its users from the worst of all plagues—the law, lawyers and inexorable 'patent rights.'"

So far the writer in "Temple Bar," and very easy and feasible it appears; but there is, in carrying out the gelatine scheme, some practical difficulty to be overcome. To make the subject as clear as possible, let me ask, what are or were the disadvan-

tages of the old sealing-wax and resin plan. In the first place, for home consumption, there was very little variety beyond the quality of the wax or resin, and the impression or seal stamped thereon—in many cases, no impression at all; in a general way, in removing the cork, the resin flew about, and, being very adhesive when at all warm, was exceedingly disagreeable. When the cork was cut short off and flush with the neck of the bottle, it was almost next to impossible to extract the cork without some of the resin or wax falling in amongst the contents; and this may be especially noticed in all the one-ounce bottles of quinine. Again, in those articles sent to hot climates, the resin or wax became partially melted, and the paper in which the commodity was wrapped adhered to the resin or wax; and so any distinguishing seal, stamp or mark became obliterated, and thus for any purpose of protection was valueless. Again, if the cork, as is commonly the case, be left long, and simply tied over with paper, membrane or leather, there can be no positive protection or guarantee that the contents have not been changed, mixed or otherwise tampered with. Moreover, both the paper and leather, like labels, if exposed in the window or on the counter, become dirty, and, as they cannot be cleaned, must be renewed: thus, the cost of capping is doubled and sometimes trebled; and in the case of proprietary articles sent abroad, if there was any peculiarity in the capping, as it could neither be cleaned nor exchanged, there must, I feel, have been frequent annoyances and sometimes loss.

Now, the metallic capsule was calculated to remedy much of this, although not the whole of it. It made a neat and polished finish; fly-marks, dirt or dust could at any time be washed off, and, if the capsule was properly applied, it became, to a great extent, a protection; so far, good and favorable to the employment of metallic capsules. On the other hand, if the capsule was carelessly put on, it was quite possible to remove it and replace it without injury, detriment, or discovery. Again, any writing or maker's name was not very distinct, and could only be made out after some study; moreover, there could be very little variety in appearance, which variety, in some business, is almost a necessity: variety lends a charm to most things, and

assuredly to the appearance of the shop of a pharmaceutist, a perfumer or an oil and Italian warehouseman, by whom a large amount of capsules have been used. These are some of the drawbacks to metallic capsules, to say nothing of any vexation on their account from other sources.

In gelatine we have a substance which, in the matter of capping, may be turned to account in more ways than one; still there are some obstacles in the way to perfection, but only such as may be overcome. There is room left by the writer of the "Temple Bar" article for a considerable amount of practical working. It would seem, upon the first reading, that it is only requisite to melt the gelatine, color it to taste, dip in the corks and necks of the bottles, and in a twinkling, like the tricks in a pantomime, the thing is done. Let us see what really occurs. Having melted the gelatine with as little water as necessary, and if any dirt be present having strained it, the requisite quantity of glycerin being added, and also some liquid cochineal to give a tint, the cork and neck of the bottle is dipped into it, taking care to have plenty of the material and sufficient room for the bottle; and the result is this, that, there being no slanting side-walls to the corks, the melted gelatine sticks about the cork, runs down the sides over the rim of the neck of the bottle, and gives, to say the least, a very unsightly appearance. If the cork is cut flush with the mouth of the bottle, a better thing is made; but the solution being transparent, although colored, the top of the cork or bung shows through, and has by no means a neat look. It is obvious that this latter part is to be remedied by making the solution opaque, either with white-lead, gamboge, dragon's-blood, or vermilion, as may be seen by bottles on the table. If the cork is to be left long, as in most bottles containing liquids, then the side-walls, so as to form a perfect capsule, must be first made by tying over with membrane, leather, or paper, and then by dipping either into the transparent or opaque solution, and thus a very good substitute for a capsule can be made; but as yet there is nothing to indicate any particular article or maker; there is nothing to prove that the covering has not been taken off and afterwards re-tied and dipped. To meet this want,—and it is a want, because most capsuled articles are proprietary ones,—the transparent solution, either plain or col-

ored, must alone be used; any name, device, band, or trade-mark may be first affixed, and then the dipping should take place. Colored leather can be employed, as in some of the samples. I may mention that generally two dippings will suffice for paper and skin, and three for leather, as that substance absorbs more; but it depends upon the strength of the solution, and a little practice will do more than a whole written volume in producing expertness. For the opaque capsule, where a name is not material, Russian glue will answer as well as gelatine, and at a considerably less cost. Amongst the various specimens which I have brought, there is one with aloes, for the especial patronage of the insects. I think I hear some one say, How about the cost? To this I am not quite prepared with an answer, but I do not think it could equal that of metal; something less than a shilling would pay for all the gelatine I have here used, say 60 to 70 bottles. I think another inquires, How long have they been done? Many in the early part of December, six or seven weeks, and these appear as perfect now as then. I must just say another word in favor of gelatine. When the bottle is to be opened, if the cork has been made short, it is only necessary to cut through the gelatine, which is easily done, and then remove the cork in the usual way: no pieces will fall amongst the contents. For bottles with long corks, and covered with any of the materials mentioned, cut the capsule round and remove it, but it cannot be used again for the same or any other bottle, and is thus, with a proper mark or label, a certain and perfect protection against the probability of the bottle being refilled with a substitute without detection; and, when dirty, the gelatine capsule can be cleaned with a sponge and a little water, thus effecting a considerable saving.

I have thus endeavored, with the assistance of "Temple Bar," to lay before you a subject which, I believe, may be advantageously made use of. I feel that I have not thoroughly exhausted it, and that some of you, more ingenious than myself, will be able to work it out more perfectly, and then, as I have done, bring your results to a future evening meeting.

"Into your scrip I pour my little store,
And as I give, I wish the little more."

—*Lond. Pharm. Journ., March* 1, 1866.

THE MANUFACTURE OF CITRIC ACID BY CITRATE OF MAGNESIA.

By M. Perret.

The manufacture of citric acid from lemon juice is an operation of considerable delicacy.

The industrial resources of Sicily, and the want of practical processes, render this fabrication impossible on the spot where the fruit is produced; the readiness with which lemon juice, the natural lemons, and the citrates of lime which have been made on the spot become altered, occasions great losses to the English manufacturer, who imports these various products from Sicily.

These considerations, joined to that of the saving in cost of transport, which would result from producing the citric acid in Sicily itself, have determined me to undertake some researches in this direction, by which I have arrived at a very satisfactory process.

It consists in making a tribasic salt of magnesia, and transforming this salt into a crystallizable bibasic salt.

The fresh lemon juices are treated directly by an excess of magnesia, which is abundant in Italy.

A perfectly insoluble tribasic citrate of magnesia is thus formed. This salt does not become altered; precipitated hot from the juices, it is in the form of a granular powder, very dense, readily separating in water (which softens it,) and which, seen through a magnifying glass, is found to be composed of a mass of small prismatic crystals; this powder, freed from mother liquor by some cold washings, or by a single washing, and dried, is perfectly unalterable, resisting moisture and heat for a long time without becoming covered with mould.

This salt, then, such as it is, may be despatched from the place where the citric acid is made; but it is evidently better to accumulate the acid upon this salt, and for this purpose I treat a given weight of tribasic citrate with a fresh quantity of lemon juice equal to that which served in the first operation; throwing the tribasic citrate in small portions into the hot lemon juice, where it instantly dissolves.

Having thus obtained the solution of bibasic salt, I leave the solution to deposit, decant and evaporate in vessels as wide as

possible, until the boiling solution marks 23°, when I allow the liquid to stand. In twelve hours' time an abundant crystallization (which continued for ten days) was already deposited, consisting of a citrate, which was the bibasic citrate.

I have submitted to the Society some specimens of this salt prepared in the way described, and which, it may be seen, crystallize very distinctly.

It is this compound which, being very easily made in Sicily itself, it would be advisable for English and French manufacturers of citric acid to import.

The object of my note is to make known,

1st. A new process for making citric acid.

2d. An easy way of obtaining citrate of magnesia, which has not hitherto been obtained, and which is therapeutically of importance.

I obtained the same result by using citric acid and magnesia or sub-carbonate; so that for pharmaceutical purposes my crystallized citrate is very easily prepared, and for lemonade may be used in the proportion of

Crystallized citrate	80 gr.
Sweetened and flavored liquid . .	350 to 400 "
Bicarbonate of soda	4 "

Lemonade prepared in this way will keep a very long time.—*Lond. Chem. News, March* 2, 1866, from *Bulletin de la Société Chimique, January*, 1866.

VERMIFUGE PROPERTIES OF PUMPKIN-SEEDS.

Whether the circumstance be due to the inefficacy of kousso, or the high price of the drug, pumpkin-seeds are again becoming with the profession a popular remedy for tapeworm. We may adduce, in illustration of this statement, two papers published in the month of August by M. Bouvier, a medical officer in the Belgium service, and by Dr. Desnos, of the hospitals of Paris.

M. Bouvier relates, in the "Archives Médicales Belges," that a little German boy, aged 5, and his sister, both presented symptoms of tapeworm after eating raw and smoked Westphalian ham. The little girl had been cured two years previously,

but the boy, who had been ill three weeks only, was in a state of alarming emaciation. Pomegranate-bark had been exhibited, but its only effect was to induce severe colic. M. Bouvier then prescribed pumpkin-seed paste, prepared by bruising an ounce of the seeds denuded of their cuticle with sugar, and adding two ounces of milk. On the previous day, the child had taken two teaspoonfuls of castor oil, and was kept on low diet. The oil was repeated on the day which followed the exhibition of the paste, and no food was allowed.

The medicine was taken without repugnance, and produced neither colic nor nausea. Several motions were induced, in each of which fragments of the tapeworm were detected, and the head and hooklets were found next day in a hard stool. The mother having thus acquired the certainty that a cure was effected, at once displayed the undoubted proofs of the happy results of the medicine to Dr. Bouvier.

Dr. Desnos reports two closely analogous cases in the "Journal de Chemie Médicale." The patients were a saddler, aged 33, and an operative, aged 22. In the former, the leading feature was an enormous increase of appetite; he consumed as much as twenty-four pounds of solid food in the course of the day. The tænia was passed after two days' treatment. Forty-eight hours after his admission into the hospital, the patient drank a bottle of seidlitz-water, and took an emulsion prepared with ten drachms of pumpkin-seeds, five drachms of castor-oil, and the same quantity of honey.

The medicine was exhibited in the morning, and in the afternoon the patient passed two mètres of tænia, with the head of the parasite.

In the second case, kousso had been resorted to without benefit. On the 9th of July, two days after the patient's admission, he was deprived of food, and on the 10th took an emulsion of pumpkin-seeds denuded of their cuticle, in six ounces of water, and half an hour later three tablespoonfuls of castor oil, mixed with an equal quantity of peppermint-water. On the 11th, the worm was passed entire, rolled up in a ball; the patient suffered some pain, but less violent colics than he had previously experienced from the kousso. On the 12th, castor-oil was again administered, and no relapse has since taken place.

Dr. Desnos remarks, in conclusion, that results even more favorable may be obtained from the combined action of the resinous extract of male fern with pumpkin-seeds; the following is the formula recommended by Dr. Debout:—

℞ Pumpkin-seeds, ʒx.
Sugar, ℥j.
Water, ℥vj.
Extr. of male fern, ʒj–ij.

To be taken fasting in four doses, at intervals of a quarter of an hour.—*Lond. Pharm. Journ.*, and *Dublin Medical Press*, from *Journ. of Pract. Med. and Surgery.*

COPAL RESIN.

To clear up any of the doubts which exist as to the true source or rather sources of this resin, would be to solve one of the many problems in economical botany. The term Copal, as is well known, is applied in commerce to most clear resins capable of producing a colorless varnish; for instance, East Indian Copal or Piney Varnish is produced by *Vateria indica*, L., a tree of the Natural Order *Dipterocarpaceæ*, while the African copals are undoubtedly the produce of Leguminous trees. The source of gum anime is another of these economic puzzles. One of the differences between those two resins—copal and anime—is that the former is mostly very clear and almost colorless, while the latter is always of a brownish tint. Both resins are sometimes rough on the surface, caused by the action of sand while the resin is in a soft state. The trees grow in the neighborhood of the seashore, and the resin exuding trickles down and buries itself in the sand beneath. This roughened surface, called at Zanzibar "goose-skin," is, of course, found only on the resin which has been buried, but the distinguishing characters of the resins themselves are so well known as hardly to need mention; what we are chiefly concerned about is to know how many distinct plants furnish the Copal of commerce.

Lieut.-Col. Playfair, H. M. Consul at Zanzibar, has recently transmitted to the Kew Museum, in answer to a request of the late Sir W. J. Hooker, some fine specimens of the bark of a tree

with the resin *in situ*, together with fruits of the same plant, and various specimens of collected resin. On the bark the resin is thickly formed in large irregular masses; the external appearance is of a dusky grey, but its fracture is of a clear light shining yellow. The tree yielding this resin, Col. Playfair thinks, is the true Copal of the mainland of Zanzibar; this is an announcement of some importance, in support of which we anxiously look for further confirmation. Believing, however, the fruits to be what Colonel Playfair sends them for, viz., the fruits of the Zanzibar Copal tree, there seems to be little doubt, on comparing them with specimens in the Kew Herbarium, that they belong to *Hymenæa mossambicensis*, Kl. Col. Playfair says in his report to the Foreign Office, in answer to Earl Russel's inquiries respecting the supply of resin, that the value of copal exported from Zanzibar amounted during the year 1863–4 to 163,353 dollars, the average price being about six pounds for one Austrian dollar. The sums were made up as follows:—

United Kingdom	$30,030
British India	50,044
Kertch	500
United States	5,000
Hamburg	30,000
Italy	2,339
Total, ...	$163,353

If, therefore, a revenue like this is derived from the resin of this particular plant in Zanzibar, it would be well if Madagascar, where the plant likewise grows, could open up a similar traffic in the same commodity.

Captain Burton says of the Zanzibar Copal tree, that out of its trunk "canoes have been formed 60 feet long, and that a single tree has sufficed for the keelson of a brig; the average size, however, is about half that height, with from 5 to 6 feet girth near the ground." The trunk "is dotted with exudations of raw gum, which is found scattered in bits about the base." The resin is also found in a semi-fossil state, sometimes in places overflowed by the high tides, or when sinking piles for huts, etc.

Captain Burton further says that "the East African seaboard from Ras Gomani in S. lat. 3° to Ras Delgado in 10° 41′, with a medium depth of 30 miles, may be called the Copal Coast."

At Zanzibar the resin is sifted and cleansed from impurities before it finds its way into the hands of the foreign merchants; after this it is again cleansed by washing in chemical solutions of various degrees of strength, care being taken to thoroughly purify, but at the same time not to injure the so-called "goose-skin," or the impress of the sand.

All parts of the plants of the copal-yielding species of *Hymenæa* are highly charged with resin, and in none is it more apparent than in the fruits of the species sent home by Colonel Playfair. The little warts or verrucosities upon the surface of these pods are lumps of clear, colorless resin, simply covered with the thin epidermis or cuticle of the pod. To such an extent are these pods charged with resin, that they burn freely upon the least approach of flame. The same property is observable in the pods of the South American species, *Hymenæa Courbaril*, from the trunk of which exudes very large quantities of resin; but this pod being larger and mere ligneous, and the resin distributed in small ducts all over the surface without penetrating the substance of the pod, does not burn so readily, nor is the quantity of resin so large. The outside of these pods much resembles in appearance the sand-fretted surface of the resin.—*Lond. Pharm. Journ.*, from *Gardners' Chronicle.*

ON PRODUCING HIGH TEMPERATURES BY MEANS OF COAL GAS AND AIR.

By M. Th. Schlœsing.

Chemists have not as yet derived from coal gas all the advantages as a source of heat which it is capable of affording. The apparatus used in laboratories gives, at most, the temperature of white heat, unless the air is replaced by oxygen, as is done by MM. H. Sainte-Claire Deville and Debray. By ascertaining the temperature produced by gas burnt with an exactly sufficient quantity of air, and that produced simply by the flame of a jet,

the possibility of producing high temperatures by its simple combustion in air is proved. It is a question of apparatuses, which I propose to resolve as follows :—

I considered that there were two principal conditions to be fulfilled: 1. Combustion, without excess of air or gas, effected entirely in the space to be heated; 2. Sufficiently rapid supply of the burning gases to keep up the high temperature, in spite of the losses by the casings, or any other expenditure of heat. With respect to this second condition, in most of the operations requiring a high temperature, the loss of heat through the casings is the chief cause of cooling, and it is in proportion to their size; hence the advantage of large furnaces over small ones—taking into account only the better employment of the heat.

These two conditions I found to be realized by the following arrangement :—Air is forced into a copper pipe of from three to four decimetres long, through a tube running a few centimetres into the pipe; two opposite holes are pierced into the pipe a little behind the orifice of the tube; at this point the pipe is surrounded by a muff supplied with gas, which is drawn into the current of air, and becomes mixed with it. The action of this apparatus cannot be better described than by supposing a Bunsen's jet with the air, and the gas entrances reversed, the gas entrance much enlarged and admitting air, and the air holes admitting gas. The delivery of gas is of course regulated by a cock, that of the air by a given pressure. On igniting in the air the gaseous mixture thus produced a large blue flame is the result, the heat of which does not appear to be more intense than that of an ordinary blowpipe of equal expenditure; but if the jet penetrates a refractory envelope, without taking the outer air with it, the flame, which I suppose to be produced by a mixture, in theoretical proportions, of gas and air, becomes very short, and the combustion takes place entirely in a confined space; this is doubtless caused by the previous condition of the mixture of fluids, due to their simultaneous entrance into the same pipe. It does not follow that this mixture of explosive gases is dangerous. In fact, from the researches made both by M. Demondésir and myself, on the combustion of gaseous mixtures, it has been found that the velocity

with which combustion is propagated in a large tube, is for the theoretical mixture of gas and air, not more than five metres the second. If, then, the speed of supply in my blowpipe is notably greater, the flame would not be able to back so as to burn in the interior of the pipe. Moreover, an explosion under such conditions need cause no alarm. Nor need any attention be paid to the fan furnishing the air, pressures of from fifteen to twenty centimetres of water being quite sufficient; but great care must be taken to provide for the escape of the products of combustion.

I use M. Enfer's bellows, which I regulate by conveying the current into a kind of gasometer formed by a large receiver fixed in an outer cover filled with water, a guage indicating the pressure. The gas is regulated by a cock, the key of which is provided with a long handle, so that very slight movements may be made. . The mixture is at its highest point of perfection when two very slightly different positions of the cock give by turns oxidizing and deoxidizing gases, which can be ascertained by applying a large copper wire to the entrance of the furnace.

To heat a porcelain tube to white heat I fix at the end of the blowpipe a kind of flattened funnel, which transforms the cylindrical jet into a sheet of flame; I place the edge of the funnel between two refractory bricks bound together by iron wires, one of them having been filled so as to make after its junction with the other a vacant space, forming the continuation of the funnel, and in which the gaseous sheet spreads out until it escapes through an opening from 11 to18 centimetres long and from 2 to 3 millimetres broad; it is only after thus escaping, and provided its velocity is greater than that above mentioned, that it burns. I avoid exposing my tube too near the escape, as the porcelain would be melted wherever struck directly by the flame. At each side and at the two ends of the aperture I place four pieces of brick, confining the flame in a space from one to two centimetres broad by from five to six high. A little above I place my tube, and cover it with some conveniently-shaped pieces of brick; the lighted gases divided by the tube surround it and reunite above to escape by a longitudinal aperture. The heating should of course be gradual from the first. I commence by admitting very little air, then slowly open the gas cock until the limit at which

the mixture of air and gas is inflammable is barely exceeded. In spite of the excess of air the combustion is then very incomplete; the hydrogen burns, but the carbon only forms oxide; the temperature is then very slightly raised, and the tube bears it without injury. Little by little I increase the air and the proportion of gas, until in about five minutes I arrive at the desired speed.

For heating a crucible I make other arrangements: placing two bricks flatwise together, to form the pedestal of the furnace, in the centre I place the crucible on a cheese; for which I make a verticle covering with pieces of brick of equal size bound together with an iron wire. This covering rests on four blocks, so arranged as to have between it and the pedestal a free space of three to four millimetres. This verticle envelope I cover with a brick pierced through the middle to receive my blow-pipe. Thus I heat from above, the flame strikes the cover, spreads over, descends, and escapes all around by the circular outlet made by the blocks.

It is possible to vary in many ways the form of the flame and that of the coverings, according to the object to be heated. Surprising results are produced by this mode of heating. I once melted, in twenty minutes, in a Paris crucible, a piece of iron weighing 400 grammes, and, in the same length of time, the porcelain of a Bayeux tube was transformed into transparent glass. Nor is the consumption of gas excessive. I have estimated it approximately, and found that, to heat to white heat during twenty minutes, a porcelain tube, of twenty millimetres by eighteen centimetres long, about 250 litres of gas were consumed; while from 400 to 500 were required to melt a piece of iron. The danger of melting porcelain tubes necessitates some precautions. I place at one end a flask with the bottom blackened, and through this I watch the effects of the heat on the porcelain; the flask is tubulated when the gas is required to circulate in the tube. On the first appearance of any distortion in the tube I diminish the current. With a blow-pipe and a furnace with tubes, the pressure of air corresponding to the commencement of fusion of porcelain should be ascertained, and the temperature kept below that point. This pressure limit is evidently

variable, according to the dimensions of the blow-pipe and furnace. It is, of course, advisable to increase as much as possible the diameter of the former, so as to diminish the bellows' work, bearing in mind that the velocity of the gaseous mixture has a low limit, which must not be exceeded.—*Lond. Chem. News*, March 2, 1866, from *Comptes Rendus*, lxi. 1131.

PIMENTO.

As Pimento is included in the Materia Medica of the Pharmacopœia, the following particulars respecting its cultivation, given by the correspondent of the leading daily paper, may interest our readers :—

"Out of Mincing-lane and the offices of colonial brokers few English people know much about pimento. Yet it ranks third among Jamaica exports, and, next to sugar and coffee, makes the most important figure in the island cultivation. Jamaica enjoys a monopoly of this product. Every attempt to carry the seed to St. Domingo and Cuba, and to propagate it there, has failed, and though the tree is found in Yucatan the fruit is not exported thence. In English households the berry is known by its familiar name of 'allspice,' here it is called 'Jamaica pepper,' but, in the language of price currents and of commerce, it is always pimento. A visit to a pimento 'walk' in the mountains, about ten miles from Kingston, enables me to see something of the mode of cultivation.

"This mountain estate comprises about 800 acres, on which, apart from its chief produce, nearly every tropical fruit and vegetable that one can mention grows in profusion. No large properties adjoin it, but close by are numerous negro settlements, which enjoy the same advantages of temperate climate and fruitful soil. Oranges, limes, lemons, grape fruit, shaddocks, bread fruit, plantains, bananas, cocoa-nuts, the cabbage palm, sugar cane, coffee, with yams, cassava, arrowroot, and ground provisions in an endless variety, thrive here. The pimento-trees, which yield the staple produce, grow in hundreds. It is a white-trunked, shapely-tree, not unlike in shape and growth an English apple-tree, but with a thicker, richer foliage and dark, glistening

leaves, aromatic like its fruit, and resembling those of the myrtle. It is, in fact, a tree of the myrtle tribe. The trunk is white, because every year the bark strips. Nature seems to have intended that some useful purpose should be served by the bark, but hitherto it has not been made available commercially. The tree blossoms twice, but only bears once a year; the blossom that holds and sets to the fruit appears in April. A sprig or two of the white, fragrant flower was to be seen now. It had the unmistakable 'allspice' smell, and when the whole 'walk' is in blossom, the air must be laden with rich, aromatic perfume. The berry grows to the size of a black currant, and is ready for picking about the last week in July. It must be green when picked, for if allowed to ripen it loses its aromatic properties and becomes sweet instead of spicy. After being rubbed from the stalks and dried in the sun, it becomes a rich brown, and when passed through a fanner, is bagged and ready for shipment. The term sometimes used to denote the in-gathering of the crop is not picking, but 'breaking,' because with each cluster of berries a portion of the branch is broken off, the tree thriving all the better for the spoliation. The crop is a very variable one, and sometimes fails altogether. But the tree costs nothing in cultivation, and the walk is always laid out in grass, like an English orchard. On the other hand, pimento, like sugar, has decreased much in value of late years. It used to be worth 6d., or even 1s. a pound, but at this moment fetches only 2½d. to 3d. Misfortunes never come singly, and poor Jamaica has certainly had a run of ill-luck in late years.

"Before the war with Russia there was a large demand for pimento from that country for use in spiced bread; but during the blockade it was found that a tree growing on the banks of the Amoor yielded a bark which, when grated, was pungent enough to supply the pepper, and aromatic enough to yield the spice, and the Russian market was thus lost. So pimento growers, like sugar growers, despond; though, enjoying a monopoly of production, they cannot complain that they have to sustain an unfair competition with slave labor."—*Chemist and Druggist*, March 15, 1866.

THE FORMATION OF ACETYLENE IN INCOMPLETE COMBUSTIONS

By M. Berthelot.

Acetylene is formed, as I have already proved, at the expense of most organic compounds when submitted to the prolonged influence of a red heat. I now purpose showing the formation of this same carbide under a condition not less general—namely, incomplete combustion.

The following is a general experiment proving this fact either with gas or with very volatile liquids :—

Take gas such as ethylene, C_4H_4; hydrochloric ether, C_4H_5Cl; propylene, C_6H_6; methylic ether, $C_2H_2(C_2H_4O_2)$; marsh gas, C_2H_4, &c.; or, better still, a very volatile liquid, such as ordinary ether, C_4H_4 $(C_4H_6O_2)$; amylene, $C_{10}H_{10}$; hydride of amylene, $C_{10}H_{12}$ and even benzole, $C_{12}H_6$; acetone, $C_6H_6O_2$ methylformic ether, $C_2H_2(C_2H_2O_4)$, &c.

Fill a test-tube of 300 cubic centimetres capacity with gas, or pour into it a few drops of volatile liquid; then add a few cubic centimetres of ammoniacal cuprous chloride, set fire to the combustible vapor, and incline the tube almost horizontally, rolling it about, so as to spread the cuprous reagent over all the interior; cuprous acetylide will speedily be produced. It is produced by the contact of the flame from beneath, and is seen in the form of a characteristic red precipitate.

This experiment answers especially well with ordinary ether and hydride of amylene.

The amount of acetylene produced under these circumstances in the form of acetylide is evidently larger than that produced under the influence of heat alone, acting on the same compounds. The quantity of acetylene actually produced is, moreover, much greater than that which takes the form of acetylide, because the greater part of the acetylene burns almost as soon as formed, and without coming in contact with the reagent. I think it possible to deduce from this experiment, conveniently modified, a method of preparing acetylene more advantageous than those hitherto in use.

Coal gas is no exception to this general rule, as may be easily

ascertained by observing the traces of acetylene it contains in its normal state.

I have, on the contrary, obtained no result, either with a mixture of oxide of carbon and hydrogen or with hydrogen charged with pure carbon dust, or directed in a jet on a stick of retort coke.

Not only is acetylene formed during combustion, in a half covered vessel of hydrocarbonated compounds, but it is produced and discharged into the atmosphere whenever an organic compound burns in contact with the air with formation of lamp-black.

This may be seen by placing the mouth of a tube over the flame, far enough off not to interfere with the combustion, and by drawing away the gases produced by the aid of a slow flow of water (one or two litres per minute). A dry, empty flask, of about a litre, is thus filled by displacement with the gases of the combustion. After several minutes, put into the flask a few drops of ammoniacal cuprous chloride, and the characteristic precipitate will be produced, though much less abundantly than in a half covered vessel. I have especially obtained this result by burning the following bodies in a small capsule:—Ordinary ether; benzole, $C_{12}H_6$; oil of turpentine $C_{20}H_{16}$; petroleum; vegetable oil; stearic acid, naphthaline, $C_{20}H_8$.

The results given by benzole and naphthaline merit attention from the fact that I have hitherto failed to transform these carbides into acetylene by heat alone. This is another proof of the extreme stability of acetylene, particularly when mixed with a certain portion of foreign gases.

The same observations are applicable to the combustion of coal gas. The gases discharged into the air, whether by the flame of a burner known as the bat's-wing, or by the smoky flame of one of Bunsen's burners, contain a notable proportion of acteylene.

These observations will explain the odor observable in rooms where gas is burnt. However, acetylene in the air exercises, by itself, no specially pernicious physiological action; for I have ascertained, by an experiment in which M. Arm. Moreau was kind enough to join me, that its poisonous action is not more marked than that of ordinary carbides of hydrogen. But its presence is an evidence of incomplete combustion; such a com-

bustion should produce a considerable proportion of carbonic oxide, to the injurious properties of which M. Leblanc has testified.

From the point of view of the theory of combustion, the general formation is not without interest. In the first place it is contrary to the positive axiom that the whole amount of the hydrogen of hydrocarbons is completely burned during incomplete combustion, leaving free carbon.

Now in the imperfect combustion of napthaline, a body much less hydrogenized than the acetylene C_4H_2, which it engenders, it must be admitted that a portion at least of the original carbide loses its carbon before its hydrogen—$C_{20}H_8 = {}_4C_4H_2 + C_4$.

In fact, the combustion of hydrocarbonated bodies is not effected at once, but by a series of decompositions. The first of these decompositions causes the formation of special products, depending on the particular nature of the combustible bodies; the first product of the incomplete combustion of alcohol, for instance, is aldehyde. Then come the general products, formed during all combustions and preceding the water and carbonic acid. Carbon and carbonic oxide are the only two general products of this nature hitherto known; to these my experiments have added acetylene.—*Chem. News, Feb.* 16, 1866, from *Comptes Rendus*, lxii., 94.

APPEARANCES OF GOOD AND BAD MEAT.

Dr. Letheby, in a report on the cattle plague, gives the following characters of good and bad meat, which are especially interesting at the present time :—

"Good meat is neither of a pale pinkish color nor of a deep purple tint. The former is indicative of disease, and the latter is a sign that the animal has died from natural causes. Good meat has also a marbled appearance from the ramifications of little veins of intercellular fat; and the fat, especially of the internal organs, is hard and suety, and is never wet; whereas that of diseased meat is soft and watery, often like jelly or sodden parchment. Again, the touch or feel of healthy meat is firm and elastic, and it hardly moistens the fingers; whereas that of dis-

eased meat is soft and wet,—in fact, it is often so wet that serum runs from it, and then it is technically called wet. Good meat has but little odor, and this is not disagreeable; whereas diseased meat smells faint and cadaverous, and it often has the odor of medicine. This is best observed by cutting it and smelling the knife, or by pouring a little warm water upon it. Good meat will bear cooking without shrinking, and without losing very much in weight; but bad meat shrivels up, and it often boils to pieces. All these effects are due to the presence of a large proportion of serum in the meat, and to the relatively large amount of intercellular or gelatinous tissue; for the fat and true muscular substance are to a greater or less extent deficient. If, therefore, 100 grains of the lean or muscular part of good meat are cut up and dried at a temperature of boiling salt and water (224° Fahrenheit), they lose only from 69 to 74 grains of their weight; but if diseased meat is thus treated, it loses from 75 to 80 per cent. of its weight. I find that the average loss of weight with sound and good beef is 72·3 per cent., and of mutton 71·5 per cent., whereas the average loss of diseased beef is 76·1 per cent., and of diseased mutton 78·2 per cent. Even if it be dried at a higher temperature, as at 266° Fahrenheit, when all the moisture is expelled, and when good meat loses from 74 to 80 per cent of its weight, the proportion of loss in bad meat is equally as great. Other characters, of a more refined nature, will also serve to distinguish good from bad meat. The juice or serosity of sound flesh is slightly acid, and it contains an excess of potash salts, chiefly the phosphate; whereas diseased meat, from being infiltrated with the serum of blood, is often alkaline, and the salts of soda, especially chloride and phosphate, abound in it. Lastly, when good meat is examined under the microscope, the fibre is clean and well-defined, and free from infusorial creatures; but that of diseased meat is sodden, as if it had been soaked in water, and the transverse markings are indistinct and far apart; besides which, there are often minute organisms like infusorial bodies. These are very perceptible in the flesh of animals affected with the cattle plague, and Dr. Beal has described them as entozoa-like objects. They differ altogether from the parasites which constitute the trichina disease, and the measles of pork. How

far the use of diseased meat affects the human constitution is unknown. In those cases where certain parasitic diseases exist in animals, there is no doubt of its injurious nature; for the tapeworm, the trichina, and certain hydatid or encysted growths are unquestionably produced by it. Experience also points to the fact that carbuncle and common boils are in some degree referable to the use of the flesh of animals affected with pleuro-pneumonia; and occasionally we witness the most serious diarrhœa and prostration of the vital powers after eating diseased meat. It is, therefore, safest to forbid its use; and it is at all times best to guard against the possibility of injury by having meat well cooked. It should be so cooked that the very centre of the joint should be exposed for some time to the temperature of 212° Fahrenheit. The instructions of Liebig in this particular are hardly safe; for although a temperature below that of boiling water may coagulate albumen and develop the flavors of cooked meat, it may not ensure the destruction of dangerous parasites. It is therefore better to have the meat a little overcooked than otherwise."—*Lond. Pharm. Journ.*, March 1, 1866, from *Chem. News.*

PREPARATION OF IODIDE OF POTASSIUM.

Fuchs places 100 parts of iodine in a porcelain dish with 260 parts of distilled water, and adds thereto 75 parts of pure carbonate of potash and 30 parts of iron filings. The mixture is well stirred together, and allowed to stand. The action proceeds slowly by itself, but is hastened by the application of heat. When the evolution of carbonic acid has ceased, the mixture is evaporated to dryness with continual stirring. It is better to allow the mixture to stand for some time in a lukewarm drying oven until all the iron is peroxidized, and then evaporate to dryness. The dried mass is then placed in an iron vessel and heated to a dull redness. The residue is then extracted with the smallest quantity of distilled water; the solution, which has usually an alkaline reaction, is then saturated with hydriodic acid, and set aside to crystallize.—*Chem. News, Dec.* 22, 1865, from *Dingler's Polytech. Jour.*, Bd. 177, s. 251.

NOTE ON THE PURIFICATION OF PLATINUM.

By Mr E. Sonstadt.

The tendency of platinum to alloy with other metals at a temperature far below its fusing point is sufficiently well known to every user of platinum crucibles. It is equally well known that iron, &c., which has been absorbed by platinum, cannot be removed, except superficially, by the action of hydrochloric acid for instance, nor even by heating in acid sulphate of potassium. Stas, in his memoir on the atomic weight of silver, &c., states that he purified his platinum vessels from iron by causing them to come in contact, at a red heat, with the vapor of chloride of ammonium. The process had to be repeated as often as any yellow sublimate was formed. This process is less effectual, or less conveniently and speedily effectual, than the modification of it that I have to propose; because if the vapor of the sal ammoniac is generated from the solid salt in the vessel to be purified, the heat absorbed in the vaporization of the salt tends to keep the vessel at a temperature below that at which volatile metallic chlorides are most readily formed. Instead of chloride of ammonium, I put dry double chloride of ammonium and magnesium in the platinum vessel intended for purification. The vessel is then heated to about the fusing point of cast iron for about an hour. I find a Gore's furnace convenient for this purpose. In this process, not only is chloride of ammonium vapor given off for a long while with the double salt, at a temperature much above that at which chloride of ammonium alone volatilizes, but when that salt is completely expelled, the chloride of magnesium remaining is perpetually decomposed with evolution of free chlorine, and, frequently, the formation of a crystalline crust of periclase lining the crucible. Platinum thus purified is softer and whiter than ordinary commercial platinum. The method is not available solely for the removal of iron, but retrieves crucibles that have become dark colored and brittle from exposure to gas flame, as well as crucibles that have been attacked by silicates during fusion of these with carbonate of sodium. I cannot conclude this note without remarking on the extreme facility with which platinum becomes impure by heating in contact with matters containing only a very small proportion of substance capable

of attacking the metal. Thus, a platinum crucible becomes sensibly impure after prolonged ignition at a high temperature, bedded in commercial magnesia. On the other hand, I have kept a platinum crucible at a constant weight to the tenth of a milligramme over a series of intense ignitions, when the precaution has been taken to bed it in chemically pure magnesia.—*Chem. News, March* 30, 1866.

NEW PROCESS FOR INDIGO DYEING.

By M. J. C. Leuchs.

Before it can be used for dyeing, indigo must be rendered soluble in alkaline and caustic solutions by being treated by a reducing body; by this reaction indigo loses its color, but after being fixed on stuff and exposed to the air it absorbs fresh oxygen and returns to its original color. This process, theoretically so simple, is practically complicated by serious difficulties, and requires, on the part of the dyer, much practice and great dexterity. Thus, for instance, with indigo reduced by fermentation with vegetable matters in a caustic solution, the various acids produced during the fermentation combine with the alkali, the liquid soon ceases to be caustic, and loses the property of dissolving the reduced indigo. To remedy this a fresh quantity of alkali (soda, potash, or lime,) must be added from time to time; but should an insufficient quantity be added, a portion of the reduced indigo remains undissolved, and soon decomposes under the fermenting matter. If, on the contrary, an excess of alkali be added, a certain quantity of white indigo is lost by its combining with potash, and forming an insoluble product.

According to M. Leuchs (of Nuremburg), all these objections are obviated by effecting the change from blue to white indigo by pectine. Pectine exists in considerable quantities in the turnips of different species, in pumpkins, melons, &c.; it may be extracted from these fruits, or they may even be directly used to reduce indigo. The most simple process consists in heating 45 or 50 kilogrammes of the caustic ley to 75° C., adding half a kilogramme of well pulverized indigo, then suspending in the vat a kind of basket of iron wire, containing from 8 to 10 kilogrammes of fresh

turnips, cut into small pieces. Then heat gradually to boiling point; the indigo soon loses its color, and the solution, decanted into special vats and diluted with water freed from air, will be ready for dyeing purposes. Contact of air must of course be, as far as possible, avoided.

When the dye bath is exhausted it may serve for a fresh operation by adding indigo, a little caustic soda, and boiling it as above with a certain quantity of turnips.

On the iron wire trellis there will remain hardly 5 or 6 per cent. of the original quantity of turnips. This residue may be used in paper making.

The simplicity of this new process may easily be proved by introducing into a closed tube a small quantity of indigo mixed with a few drops of soda or caustic potash, adding a small piece of turnip and boiling; the indigo will rapidly lose its color, and re-dissolve and return to its original color by exposure to the air.

As turnips are not everywhere cultivated, and during certain seasons are not to be procured fresh, the author has found that the active principles may be extracted by boiling the turnips with water, under a pressure of two or three atmospheres. C. Leuchs and Co., of Nuremburg, now manufacture on a considerable scale an extract of turnips, 1 kilo. of which will dissolve cold 4 kilos. of indigo.—*Chem. News, March* 30, 1866, *from Bulletin de la Sociête Chimique, February*, p. 153.

NOTE ON SULPHOCYANIDE OF AMMONIUM.

By Frank Clowes.

Whilst engaged in purifying the above-named salt by several crystallizations from its aqueous solution, I happened to observe that some water hanging in drops from the bottom of the vessel, froze; on applying my hand to the vessel I found it to be intensely cold, and in a short time the atmospheric moisture was deposited like hoar frost on the sides of the vessel.

This led me to try a few experiments with weighed quantities of water and of the salt; from a few trials with different proportions, it appeared that the mixture of equal parts by weight gave

the most intense cold. By mixing 1386 grains of the salt with its weight of water at 17° C., a cold of (—12°) C., was obtained; the temperature of the atmosphere at the time of the experiment was the same as that of the water employed.

This method of producing cold could hardly be advantageous in a practical point of view, on account of the somewhat costly nature of the sulphocyanide; but it may be interesting to the scientific chemist as another example of a property which is known to be possessed by several other saline bodies.—*Chem. News, Feb.* 16, 1866, *from Museum of Irish Industry, January* 26.

MEDICAL PURVEYING FOR THE U. S. ARMY DURING THE LATE WAR.

We have taken some pains to gain information of a reliable character in relation to the Pharmacy of the late war, but on several occasions have been met by objections on the part of those in authority. As it is facts, and not mere outlines or opinions, that are desirable, we propose to put on record some of the official statements as they become accessible, hoping that, before long, we shall be able to give some account of the army laboratories and their working during the period when they were in full operation. The following extract from a "Statement" issued by Surgeon R. S. Satterlee, Medical Purveyor, U. S. A., at New York, will give some idea of the amount of drugs and medicines supplied from a single depot to the army during four years and three quarters. The list contains only the drugs and medicines, dressings and hospital stores, as we have not space for the other supplies which came under the head "Surgical Instruments," medical books, record books, stationery, hospital clothing, bedding, furniture and appliances, and miscellaneous articles. The moneys expended by Surgeon Satterlee in purchasing all the supplies, and for services of contract surgeons, nurses, etc., during the period mentioned, amount to the large sum of $18,086,569.31, of which $753,184.91 were in 1861, $2,779,635.21 in 1862, $3,420,334.33 in 1863, $6,472,498.41 in 1864, and $4,660,916.45 in 1865. We hope to be able to get a report of the medical purveying at Philadelphia during the same period.—Ed. Am. Jour. Pharm.

MEDICINES.	
Acid, Acetic.....lb.	3,101
" Arsenious.....oz.	778
" Benzoic.....oz.	492
" Citric.....lb.	6,754
" Hydrocyanic.....oz.	102
" Muriatic.....lb.	4,307
" Nitric.....lb.	2,214
" Phosphoric, Dilut.....lb.	1,906
" Pyroligneous.....lb.	28
" Sulphuric.....lb.	2,097
" " Aromatic...lb.	8,483
" Tannic.....lb.	2,355
" Tartaric.....lb.	5,565
" Water, Oak Orchard bot.	192
Alcohol, Strong.....qt. bot.	131,854
Alum.....lb.	6,918
Ammonia, Carbonate of.....lb.	5,647
" Muriate of.....lb.	2,743
Assafœtida.....lb.	808
Balsam Peru.....lb.	1,244
Bibron's Antidote to the Poison of Serpents.....bot.	522
Beeswax, White.....lb.	3,815
Bismuth, Subcarbonate of...lb.	972
Subnitrate of.....lb.	686
Blackberry Juice, Condensed.....lb.	960
Bromine.....oz.	3,107
Brandy.....qt. bot.	149,376
Burgundy Pitch.....lb.	537
Calomel.....lb.	756
Camphor.....lb.	11,257
Cardamon Seed.....oz.	1,576
Catechu.....lb.	1,865
Cinchonia, Sulphate of.....oz.	115,013
Citrate of Iron and Quinine oz.	27,819
Ammonia oz.	37
Chalk, Prepared.....lb.	4,745
Chloroform.....lb.	28,313
Collodion.....oz.	3,110
Congress Water.....bot.	641
Copaiba.....lb	25,853
Copper, Sulphate of.....lb	1,478
Creasote.....oz.	30,927
Cubebs, Oleo-resin of.....lb.	2,926
Disinfecting Powder.....lb.	35,148
Disinfectant—	
Carbolic Acid.....boxes	100
Chloride of Lime.....lb.	85,726
Chlorinium, (materials for preparing).....packages.	2,591
Chlorinium, (salt mixture for,).....lb.	3,270
Solution of Chlorinated Soda.....lb.	60,346
Solution of Chloride of Zinc.....lb.	7,150
Permanganate of Potassa lb.	10,683
Permanganate of Potassa bot.	7,358
Dover's Powder.....lb.	7,448
Ether, Pure.....lb.	19,848
Extract, Belladonna.....oz.	9,105
Colocynth, Comp...lb.	3,934
Gentian.....lb.	36
Hemlock.....oz.	2,514
Extract, Henbane.....oz.	5,391
Hops.....oz.	175
Nux Vomica.....oz.	4,841
Fluid Extract—	
Aconite Root.....lb	3,139
American Hellebore.....lb.	10,042
Black Pepper.....oz.	64
Buchu.....lb.	4,215
Colchicum Root.....oz.	546
Seed.....lb	3,114
Columbo.....lb.	169
Dandelion Root.....lb.	304
Ergot.....oz.	5,399
Foxglove.....oz.	101
Gentian.....lb.	4,186
Ginger.....lb.	14,181
Henbane.....oz.	752
Ipecacuanha.....lb.	3,479
Jalap.....oz.	211
Peruvian Bark.....lb.	10,165
Pinkroot.....lb	1,811
Quassia.....oz.	241
Rhubarb.....lb.	2,920
Sarsaparilla.....lb.	973
" Comp.....lb.	25
Seneka.....lb.	4,671
Senna.....lb.	483
Valerian.....lb.	2,150
Wild Cherry Bark.....lb.	4,116
Flaxseed.....lb.	24,575
Gum Arabic.....lb.	1,560
Glycerin.....lb	6,983
Hops.....lb.	71
Honey, Clarified.....lb.	541
Iodine.....oz.	28,000
Iron, Hydrated Oxide of, (materials for,).....pkgs.	1,110
Iron, Iodide of.....oz.	71
Plaster.....lb.	45
Sulphate of.....lb.	6,932
Lead, Acetate of.....lb.	4,623
Lime Juice.....gal.	305
" " .....bot.	3,500
" Water.....lb.	141
Liquorice.....lb	11,122
Lupuline.....oz.	179
Magnesia.....oz.	26,096
Sulphate of.....lb	182,350
May-Apple, Resin of.....oz.	3,519
Mercurial Pill Mass.....oz.	91,139
Plaster.....lb	31
Mercury, Corrosive Chloride oz.	3,978

Mercury, Iodide of	oz.	1,765	
Red Oxide of	oz.	2,809	
with Chalk	lb.	1,142	
Morphia, Sulphate of	oz.	9,161	
Myrrh	lb.	41	
Ointment, Cantharides	lb.	4,104	
Carbonate of Zinc	lb.	747	
Ointment, Mercurial	lb.	10,111	
Nitrate of Mercury	lb.	1,941	
Ointment, Resin	lb.	20,156	
Simple	lb.	74,190	
Oil, Castor	qt. bot.	60,176	
Cinnamon	oz.	4,825	
Cloves	oz.	171	
Cod Liver	qt. bot.	34,403	
Croton	oz.	8,451	
Cubebs	oz.	34	
Olive	qt. bot.	43,587	
Origanum	oz.	480	
Peppermint	oz.	823	
Turpentine	qt. bot.	27,490	
Opium	lb.	1,101	
Elixir of, McMunn's	bot.	75	
Pills, Assafœtida	doz.	100	
Camphor and Opium	doz.	143,167	
Cathartic, Comp.	doz.	197,345	
Citrate of Iron and Quinine	doz.	2,721	
Pills, Colocynth and Ipecacuanha	doz.	2,728	
Pills, Mercurial	doz.	1,446	
Opium	doz.	193,155	
Quinine	doz.	62,483	
Sulphate of Cinchonia	doz.	100	
Pulverized Aloes	oz.	10,150	
Cantharides	oz.	7,109	
Cayenne Pepper	lb.	4,500	
Cubebs	lb.	8,750	
Ergot	oz.	149	
Flaxseed	lb.	148,084	
Gum Arabic	oz.	229,260	
Guaic	lb.	51	
Kino	lb.	97	
Ipecacuanha	lb.	4,374	
Iron	oz.	156	
Jalap	oz.	815	
Liquorice	lb.	1,503	
Mustard	lb.	64,351	
Opium	lb.	6,251	
Persulphate of Iron	oz.	11,243	
Peruvian Bark	lb.	4,790	
Rhubarb	lb.	2,948	
Savine	oz.	355	
Squill	lb.	1,365	
Slippery Elm Bark	lb.	781	
Potassa, Acetate of	lb.	1,597	
Bicarbonate of	lb.	6,193	
Bitartrate of	lb.	4,395	
Chlorate of	lb.	6,855	
Nitrate of	lb.	2,473	
Potassium, Cyanuret of	oz.	31	
Iodide of	lb.	8,380	
Quassia	lb.	81	
Quinine, Sulphate of	oz.	294,365	
Rhubarb Root	oz.	9,112	
Silver, Nitrate of	oz.	12,600	
fused	oz.	14,538	
Soap, Castile	lb.	106,314	
Solution, Arsenical, Fowler's	oz.	35,541	
Solution of Ammonia	lb.	32,363	
Morphine	oz.	868	
Persulphate of Iron	lb.	2,894	
Pernitrate of Iron	oz.	97	
Potassa	lb.	129	
Soda, Bicarbonate of	lb.	13,133	
Borate of	lb.	1,432	
Spirit of Ammonia, Aromatic	lb.	3,874	
Spirit of Ether, Comp	lb.	8,803	
Lavender, Comp.	lb.	7,535	
Nitrous Ether	lb	31,734	
Strychnia	oz.	450	
Sulphur	lb.	6,836	
Syrup of Blackberry	bot.	1,304	
of Iodide of Iron	lb.	2,963	
Simple	lb.	110	
of Squill	lb.	95,822	
Tartrate of Antimony and Potassa	oz.	3,210	
Tartrate of Iron and Potassa	oz.	410	
Tartrate of Potassa and Soda	lb.	10,578	
Tincture of Aconite Root	lb.	1,884	
American Hellebore	oz.	968	
Ergot	oz.	97	
Foxglove	oz.	349	
Iodine	oz.	149	
Larkspur	lb.	121	
Muriate of Iron	lb.	13,598	
Oil of Peppermint	lb.	9,336	
Opium	lb.	22,478	
Camphorated	lb.	18,689	
Peruvian Bark, Comp.	lb	79	
Tolu	lb.	47	
Vaccine Virus	crusts.	24,204	
Whiskey	qt. bot.	449,213	

Wine, Catawba	qt. bot.	10,468
Currant	bot.	384
Port	bot.	5,105
Sherry	qt. bot.	191,443
Tarragona	qt. bot.	44,980
of Colchicum Seed	lb.	1,498
Zinc, Acetate of	oz.	7,375
Carbonate of	oz.	4,600
Oxide of	oz.	245
Sulphate of	oz.	16,235
Hospital Stores.		
Ale	casks.	440
"	bot.	2,680
Apple Juice, Condensed	gal.	106
Arrow Root	lb.	10,626
Barley, Hulled	lb.	57,631
Beef, Extract of	lb.	296,592
Soup, Fifty Ration Boxes of	no	50
Candles, Sperm	lb.	41,501
Cinnamon, Powdered	lb.	2,148
Cloves	lb.	197
Cocoa and Chocolate	lb.	53,725
Coffee, Concentrated	lb.	2,589
Extract of	gal.	13,589
Condensed Eggs	lb.	74,568
Corn Starch	lb.	125,913
Desiccated Vegetables	lb.	55,108
Egg-Nog	cans.	514
Farina	lb.	83,630
Gelatine, Shred	lb.	4,353
Ginger, Powdered	lb.	2,930
Ice	tons.	1,796
Milk, Concentrated	lb.	254,318
Nutmegs	lb.	5,984
Pepper, Black, Ground	lb.	7,850
Portable Lemonade	lb.	1,300
Porter	casks.	89
"	pt. bot.	430,616
Sugar, White, Crushed	lb.	363,596
Tamarinds	lb.	260
Tapioca	lb.	46,467
Tea	lb.	158,051
Tomatoes	cans.	148

Dressings, &c.		
Adhesive Plaster	yds.	82,164
Binders' Boards	no	76,507
Cotton Bats	no.	23,190
Wadding	sheets.	1,718
"	lb.	825
Flannel	yds.	45,171
Fracture Boxes	no.	73
Gutta Percha Cloth	yds.	41,623
India Rubber "	lb.	143
Tissue	yds.	95
Isinglass Plaster	yds.	59,484
Linen	yds.	99,510
" rags	lb.	3,593
Lint	lb.	96,365
Leeches	no.	50
Ligature Wire	yds.	1,349
Muslin, White	yds.	668,178
Green	yds.	1,070
Napkins for Opthalmia	no.	12,316
Needles, 25; Cotton Thread, 1 Spool; Thimbles, 1—in case	no.	7,871
Needles, Sewing	no.	39,134
Oakum	lb.	67,644
Oiled Silk and Muslin	yds.	58,817
Paper	sheets.	215
Pencils, Hair	no.	88,244
Pins	papers.	30,516
Roller Bandages, Assorted	doz.	239,765
Suspensory, " "	no.	52,329
Silk, Green	yds.	5,378
Saddlers	oz.	7,218
Splints	sets.	12,830
Smith's Anterior	no.	8,440
Sponge, Fine	oz.	86,611
Tape, 8-yd. Pieces	no.	36,383
Thread, Cotton	spools.	559
Linen	oz.	19,613
Thimbles	no.	239
Tow	lb.	20,208
Towel Rollers	no.	40
Towels	doz.	38,158
Towelling	yds.	7,716
Twine	lb.	9,878

Annual Commencement of the Philadelphia College of Pharmacy.

The 45th Annual Commencement of the College was held, at the Musical Fund Hall, on the evening of the 17th of March, 1866, on which occasion more than the ordinary ceremonies occurred. It has become usual with the graduating class to present to their Alma Mater a portrait of one of the ex-Professors, for the Hall of the College. The ceremony of presentation is usually performed in the meeting-room below the Hall, previous to conferring the degrees. On the present occasion the Class desired

that these extra ceremonies should take place before the audience. The portrait was that of the late Dr. Gerard Troost, the first Professor of Chemistry in the College, and was presented on behalf of the graduates by Mr. R. C. Lippincott. Prof. Bridges, on behalf of the Board of Trustees, received it, and, in a short extemporaneous address, recalled many of the prominent points in the history of Prof. Troost, who was born in Holland in 1776, and died in Nashville, Tenn., in 1850, aged 75 years.

The ceremony of conferring the degree of Graduate in Pharmacy on the following gentlemen was then performed by the President of the College:

ALLEN, WILLIAM E.,	Philadelphia, Pa.,	*Gelsemium Sempervirens.*
BARNITZ, FRANK M.,	York, "	*How the Drug Business is, and should be conducted.*
BLAIR, HENRY C.,	Philadelphia, "	*Cypripedium Pubescens.*
BRADDOCK, ISAAC A.,	Haddonfield, N. J.,	*The Dawn of Chemical Science.*
CAMPBELL, HUGH,	Philadelphia, Pa.,	*The Druggist's Position.*
DOBBINS, ALBERT N.,	Mount Holly, N. J.,	*Cornus Florida.*
KNEESHAW, WILLIAM W.,	Trenton, "	*Petroleum.*
LAIRD, WILLIAM R.,	Reading, Pa.,	*Pyrethrum Parthenium.*
LEVERING, P. WHARTON,	Roxborough, "	*Phloridzin.*
LIPPINCOTT, ROBERT C.,	Philadelphia, "	*Rheum Rhaponticum.*
MCPIKE, WILLIAM C.,	Alton, Illinois,	*The Epidermis of Carya Alba.*
MILLEMAN, PHILIP,	Chicago, "	*Cunila Mariana.*
MILIAC, JOHN A.,	Philadelphia, Pa.,	*Veratrum Viride.*
NEWBOLD, THOMAS M.,	" "	*Sanguinaria Canadensis.*
NEWTON, JOHN S.,	" "	*Glycerin, Ferri Pyro-Phosphas and Tolu.*
PAINTER, EMLEN,	Delaware Co., "	*Liriodendron Tulipifera.*
PILE, GUSTAVUS,	Philadelphia, "	*Unguentum Hydrargyri.*
RAU, ROBERT,	Bethlehem, "	*Senna.*
REMINGTON, JOSEPH P.,	Philadelphia, "	*Our "Alma Mater," its Rise and Progress.*
RILEY, CHARLES W.,	" "	*Berberina.*
ROBINSON, JOSHUA K.,	Newark, Del.,	*Hamamælis Virginica.*
ROSS, H. H.,	Chester, "	*Water.*
SAYRE, L. E.,	Bridgeton, N. J.,	*Cornus Florida.*
SEGNER, WILLIAM,	Palmyra, Pa.,	*The Progress of Chemistry.*
SHOEMAKER, ALLEN,	Philadelphia, "	*Sanguinaria Canadensis.*
SHOEMAKER, BENJAMIN, Jr.,	" "	*Urtica Dioica.*
SHOEMAKER, CHARLES,	" "	*Physostigma Venenosum.*
SIMSON, WILLIAM H.,	Halifax, N S.,	*Epigea Repens.*
SOUDER, JOSEPH A.,	Philadelphia, Pa.,	*Iodoform.*
STREHL, LOUIS,	Chicago, Ill.,	*Iodide of Lime.*
WALKER, THOMAS A.,	Princeton, N. J.,	*Cimicifuga.*

The valedictory charge was delivered by Professor Procter, in the course of which he alluded to his resignation of the Professorship of Pharmacy, which was to take effect on the 1st of April.

At the close of the address, Mr. John S. Newton, on behalf of the

students of the College of Pharmacy Class 1865–6, read a series of resolutions expressive of the feelings and kind wishes of the Class towards Prof. Procter, and, on their behalf, presented him with a beautiful tea-service, as a testimonial,—to which the Professor made a brief reply expressive of his gratification at this spontaneous action of the Class.

More than the usual number of bouquets, from the lady friends of the graduates, were then distributed by Prof. Parrish, thus concluding the ceremonies of the evening, which were interspersed with music by the Germania Band.

Minutes of the Philadelphia College of Pharmacy.

The Forty-fifth Annual Meeting of the Philadelphia College of Pharmacy was held at the College hall, on Monday evening, March 26th, 1866.

The President, Charles Ellis, in the Chair. Twenty-two members present.

The minutes of the last meeting were read and approved.

The minutes of the Board of Trustees were read by the Secretary of the Board. From these minutes the College is informed that, by the will of the late Algernon S. Roberts, the College is to receive an annual legacy of $200 for five years. Also, that the Trustees deemed it prudent to decline an offer of $2000 towards establishing a School of Practical Chemistry and Pharmacy, on the condition of including a permanent scholarship for two colored students.

The matriculants to the school of Pharmacy for the session of 1865–66, numbered 141.

At the Annual Commencement of the College, held on March 17th, at the Musical Fund Hall, the degree of Graduate in Pharmacy was conferred by the President on thirty-one candidates. The valedictory charge was delivered by Prof. Procter, (see page 274.)

The minutes of the Board also inform that a portrait of Prof. Troost, one of the early Professors in the College, was presented to the College by the Zeta Phi Society of the Class. Also that 31 volumes of the Journal of Pharmacy had been presented to the Harvard College Library.

A communication from the Board of Trustees, relative to the resignation of Prof. Procter, was read, accepted and directed to be entered on the minutes, as follows:

With sincere regret the Board of Trustees announce to the College the resignation of Prof. Procter from the Chair of Pharmacy in the School of this College.

On reference to the minutes of the College we find, that, at a meeting of the College held in March, 1846, a memorial was presented, accompanied by the following resolution:

"*Resolved*, That a committee of nine members be appointed to take into consideration the propriety of creating a new Professorship, to be called the Professorship of Theoretical and Practical Pharmacy; and if they deem it expedient, to mature a plan for the consideration of the next meeting."

At the next stated meeting of the College the report of the committee was received, and the subject was referred to the Board of Trustees, "with instructions to take the necessary measures for establishing the said Professorship."

The minutes of the College take no further note of the subject. The minutes of the Board of Trustees, however, inform that at an election held by the Board at a meeting on the 1st of June, 1846, Wm. Procter, Jr., was unanimously elected to the Chair of Pharmacy.

From the above statistical information, it will be seen that the Chair of Pharmacy was established twenty years ago. The wisdom of the College in creating that chair, we think no member of the present day will doubt. How successfully and substantially its foundation has been laid by the Professor, whose twenty years of labor have now drawn to a close, the graduates of the College *assembled here* this evening will cheerfully attest.

In accepting the resignation of Prof. Procter, the Board of Trustees yielded to a knowledge of his earnest desire to lay aside the duties with which he had been so long invested. We trust that in the retrospect of his past arduous labors, our retiring Professor will find a partial repayment in the progress of the generation who have listened to his instructions, and who are now taking an active part in bringing to the test of experience the lessons received from him.

We also trust that he may live to see the work so well begun and faithfully continued by himself, expand in usefulness, and show by its fruits that *he* has not labored in vain.

CHARLES BULLOCK,
CHARLES ELLIS,
JAMES T. SHINN.

Theodore A. Royal having been recommended by the Board for resident membership, was on ballot unanimously elected.

John Gilbert having offered his resignation, on account of retiring from business, it was unanimously resolved to continue to him his certificate of membership and to exonerate him from further annual dues.

The resignation of Dr. W. W. H. Githens was read and accepted.

The report of the Committee on the Sinking Fund was read and accepted, and the Treasurer of the College directed to pay to the Committee such sum as they may deem expedient.

The Publishing Committee report, that the "American Journal of Pharmacy" has been issued bi-monthly, as usual, since their last report to the College. It was *then* stated that the size of the numbers had been reduced from six to *five* forms, owing to the increased cost of materials and printing, and the falling off in the number of subscribers during the war. The Committee now inform the College that the Journal has been restored to its former size, and that a considerable increase of the subscription list, more especially from southern and western sources, has occurred. They regret to say that the volume for 1865 is already out of print (from the latter cause.) They have had to print several hundred additional copies of the numbers of the current volume.

The condition of the finances of the Committee will be found in the accompanying statement of the Treasurer.

CHARLES ELLIS,
ALFRED B. TAYLOR,
JOHN M. MAISCH,
EDWARD PARRISH,
WM. PROCTER, JR.
} *Committee.*

The Committee on Latin Labels made a report of their financial condition.

Mr. Thomas S. Wiegand, President of the Alumni Association, made a verbal report on the action of the Association towards establishing a practical school of Chemistry and Pharmacy.

The annual election being ordered, the following officers were duly elected:

President,	Chas. Ellis.
First Vice-President,	S. F. Troth.
Second Vice-President,	D. Parrish.
Treasurer,	Ambrose Smith.
Recording Secretary,	Chas. Bullock.
Corresponding Sec'y,	Wm. Procter, Jr.

Trustees.

Dr. Robt. Bridges, S. N. Jones, T. M. Perot,
S. S. Bunting, Jas. T. Shinn, J. M. Maisch,
T. S. Wiegand, D. S. Jones.

Publishing Committee.

Chas. Ellis, E. Parrish, J. M. Maisch,
A. B. Taylor, Wm. Procter, Jr.

Committee on Sinking Fund.

S. F. Troth, A. Smith, E. Parrish.

Delegates to the American Pharmaceutical Association.

Wm. Procter, Jr., Jas. T. Shinn, Ambrose Smith,
Dr. Wilson H. Pile, Wm. R. Warner.

On motion, the College then adjourned.

CHARLES BULLOCK, *Secretary.*

Editorial Department.

INTERNATIONAL PHARMACEUTICAL CONGRESS OF BRUNSWICK.—This International Congress, an invitation to send deputies to which was received by the American Pharmaceutical Association, (see page 47 of the Proceedings,) opened its session on the 16th of September, 1865, but was preceded by another reunion of great interest, viz., that of the two great Societies of Northern and Southern Germany, the former presided over by Dr. Bley, of Bernburg, and the latter by Dr. Riekher, of Marbach.

MM. Guibourt and Robinet, (from whose report we make the following abstract, and who had been deputed by the Society of Pharmacy of Paris to attend the International Congress,) being honorary members of the Northern Society, were invited to attend its sittings, at which nearly 200 members assisted, and which had for its object a general Society for mutual aid.

During two days, surrounded by testimonials of the highest respect, we assisted at the deliberations of this first meeting, and at the social gatherings which were its inevitable consequence. On the 16th of September the International Congress opened its sessions. The preliminary proceedings, viz., the verification of credentials and the election of the officers were directed by the venerable Dean, Dr. Bley.

M. Dittrich, the learned pharmaceutical chemist of Prague, was elected President, and M. Robinet, Vice President. The meeting accepted the proposition of the President to take for Secretaries the editors of the three principal Journals of Pharmacy published in Germany, M.M. Klinger of Vienna, Casselmann of St. Petersburgh, and Dr. Vorweck of Spire.

This first meeting, in a City of Northern Germany, of an International Congress of Pharmaceutists, appears to the French Delegates an event of considerable importance, and calculated to exercise a great influence on the future of the profession, and to preserve among them a grateful recollection of the zealous men who there met together.

The report gives a complete list of all the members of the Congress: three from France, nine from Russia, one from Sweden, three from Austria, three from Northern Germany, three from Southern Germany, three from Hamburgh and Altona, three from Berlin and one from Saxony.

These delegates represented twelve Pharmaceutical Associations. The reporters attributed much of the success of the meeting to the devotedness of M. Herzog, of Brunswick, who acted as commissary general, and to Dr. Björklund, of St. Petersburg, who had travelled over a great part of Europe to make known the object of the Congress, and cause the appointment of delegates.

A programme had been prepared by MM. Bley, Rieckher and Giezeler, representatives of the General Union of German Apothecaries.

Immediately after the installation of officers, the delegates formed themselves in sections in accordance with the programme, and retired to organize them by the appointment of chairmen and reporters.

On the 17th, in the morning, every one was ready. The meeting commenced by reading the reports and propositions from the sections. The reporters do not go into details in considering rapidly the actions of the Congress, and, notwithstanding the difference in usages and laws, they found among their foreign associates the same feelings, the same wishes, the same cares that have been expressed many a time at home. For instance, it was unanimously considered that the best means of elevating and sustaining the scientific position of the pharmaceutist, was to become more and more exacting in the requirements from students before they enter their career of practice; that it would be proper to appoint apothecaries in larger proportion to public positions, such as in the institutions of sanitary police, medical or pharmaceutical, and that they should be placed on the same footing with Doctors of Medicine; that it is necessary in sustaining professional dignity to discountenance all secret remedies, to suppress special homœpathic and veterinary pharmacies, etc.

On the subject recently much discussed, of a free and unlimited exercise of pharmacy, the Congress was unanimous in declaring that neither the public nor the profession desired this singular innovation.

The desire for the compilation of a universal Pharmacopœia was warmly received, and this wish is very near its realization for at least a great part of Europe. A Committee, of whom the learned M. Dankwortt is the chairman, has edited, in Latin, a universal Pharmacopœia, of which the printing is nearly finished, and of which M. Guibourt could appreciate the merit. It is evident that the best means of realizing the greatest possible unity in pharmacology is to give an example. The Pharmacopœia of M. Dankwortt has made an abstract of all the usages which require special knowledge of weights and measures, and has adopted the most rational formulas without reference to the country.

The delegates were also unanimous in asking the adoption of the Latin language and metrical system in its relations to pharmacy. But, says M. Robinet, we cannot hide from ourselves that at Brunswick as at Rennes, (the place at which the last French Congress met,) all these questions, and some others relative to the status of eléves (clerks,) the scarcity of young apprentices, the creation of provident institutions to aid pharmaceutists, all these questions were but accessories. The grand question, the real question, that which has exercised all the best minds and set in motion respectable men of sedentary habits, was that which can be called by no other name than *the question of specialities*, (secret medicines.) This was reserved for the last deliberations, after all the secondary questions were disposed of. The section charged with the treatment of this question were as distinguished as they were convincing: Dr. Björklund, of St. Petersburg, and M. Brants, of Vienna. Their written reports, inserted entire in the records of the Congress, are marked with a lively and vehement indignation. They enforce the severest blame and reprobation on the trade in secret remedies and panaceas.

M. Robinet appears to have been astonished at the demonstrative manner of his German confréres, under the excitement of debate on this agitating question, and doubts his ability to translate into French their animated discussions. His impressions of the personelle of the German members was very favorable. He describes them as exhibiting gravity, self-possession and personal distinction. All of them give assurance of having moved in the higher walks of society, and as to their knowledge and experience they are too well known in France to need praise from him. Such are the men, from one end of Europe to the other, who are so warped, worried and pressed upon by this speciality; as if their information and their prudence were insufficient to accomplish for their country the noble mission of contributing to the relief of suffering humanity. They see themselves reduced by the credulity and ignorance of the people to play a humiliating part as retailers of medicines they have not prepared, and of which, for the most part, they are ignorant of the composition. Constrained to distribute with

these drugs the directions which accompany them, they become in spite of themselves accomplices in the violation of the laws, since they are, in some degree, blind doctors and secret apothecaries. It is in vain that they contend against these crying abuses. Considerations of a kind that we cannot explain, decide the governments to permit these nostrums to be made and sold, and the legitimate complaints of our confréres beyond the Rhine are not heard.

It is to unite new forces and prepare new arms against quackery that the Congress of Brunswick has been organized.

THE CAVENDISH SOCIETY.—Those of our readers who feel interested in the proceedings of this Society will learn by the following article, published in the Chemical News for March 9th, the prospects of the Society. We hope the suggestion that the 17th volume, now partially printed, will complete the text, and that the general index will soon follow, will prove true.

Cavendish Society.—The annual meeting of the Cavendish Society was held in the rooms of the Chemical Society on March 1, Mr. Graham, President, in the chair. The report, read by the Secretary, Dr. Redwood, stated that the Council had agreed to accept a proposal made by Mr. Harrison to undertake the publication of the remaining volumes of Gmelin's "Chemistry" at his own risk, supplying them to the members at one guinea each volume. Two volumes, it is anticipated, will complete the work. A considerable part of Vol. XVII. is in type, and this volume it is expected will be completed in about four months. The Council believe that the public demand for scientific works of a superior character is now so large that there is no longer any field for a publishing society like the Cavendish, and they think the operations of the Society may fitly close with the completion of Gmelin's work. In reply to some questions asked, the Secretary stated that the back stock of the Society formed part of the consideration to Mr. Harrison for undertaking the publication of the remaining volumes. There were about 300 complete sets of the organic part in stock, but no complete set of the inorganic part was left. An arrangement had been made with Mr. Harrison by which he was debarred from selling the volumes still to be issued for less than a guinea each for the next two years. The index volume is to be supplied to the subscribers *gratis*. The balance-sheet showed a sum of 183*l.* in hand, and the outstanding liabilities of the Society were said to be very small. The report was adopted by the meeting. A resolution to continue the present council and officers was also carried, as were the usual votes of thanks.

ARTIFICIAL MINERAL WATERS.—We are informed that Mr. Eugene Roussel, who has been manufacturing mineral waters in this city for over 25 years, and whose chemical knowledge fully enables him to prepare all the various kinds of medicated waters, has now commenced manufacturing the different mineral spring waters as now prepared by Shultz and Warker of New York, such as Carbonic Acid, Seltzer, Vichy, Kissingen, Vichy with Lithia, and Lithia Waters.

These waters are put up in glass syphons containing a quart, are strictly prepared according to the latest chemical analysis of the different springs,

have the great advantage of permitting any quantity to be drawn, from a few drops to the contents of a tumbler, and will retain an excess of carbonic acid gas to the last.

United States Revenue Commission. Special Report No. 5, on Distilled Spirits as a source of National Revenue, &c., Feb. 1866. *Special Report No. 8, on Proprietory and other Medicines, Perfumery, etc., as a source of National Revenue,* Feb. 1866. Treasury Department.

Many of our readers are already aware that the last Congress caused the appointment of a commission called the United States Revenue Commission, for the purpose of investigating the whole subject of internal revenue, but more especially in reference to the leading sources of revenue, distilled spirits, patent medicines, coffee, cotton, tobacco, etc. They also know that at the last meeting of the American Pharmaceutical Association, a committee was appointed to endeavor to represent to this commission the great importance to Pharmacy of a reduction in the tax on alcohol, and to urge other ameliorations in the revenue laws bearing on Pharmacy. Several members of this committee have had intercourse with Commissioner Wells, who has the subjects of alcohol and medicines under his charge for examination, and the written views of every member have been submitted to him, with the report of the Chairman, and there is no doubt that the commissioners are earnestly disposed to cause the reduction of the tax on alcohol to one-half of its present rate. The Report No. 5, (as above), after detailing the arguments in favor of the present high rate of $2 on whiskey, says,

"That these arguments are weighty, cannot be denied, and in the outset of their investigations, they seemed to the commission entirely conclusive. Deeply impressed, however, with the conviction that a thorough inquiry into this subject was of the utmost importance to the country, and determined to let no preconceived opinions or prejudices stand in the way of an impartial discharge of their duties, they instituted a most careful and laborious examination, and have sought to avail themselves of every opportunity to acquire correct information. In carrying out this design the commission have personally examined several hundred witnesses, embracing most of the leading distillers, rectifiers and dealers in spirits in the country; the representatives of various branches of American Pharmacy, and of the industrial interests into which alcohol enters as a constituent; and have sought to acquaint themselves by correspondence and otherwise with the history and detail of foreign experience and legislation on this subject. The result of this inquiry has led to a reversal of their opinion, and induces them to believe that in a *revenue, industrial* and *moral* point of view, it would be expedient *to reduce the existing excise of $2 per gallon on distilled spirits, and to substitute therefor a lower rate of* $1 *per proof gallon.*"

The commissioners then give their reasons for this recommendation, among which the principal one is that the experience of the older governments, in raising revenue from the spirit tax, proves that when the tax is excessive it acts as a premium on illicit distillation, and whilst the quantity *consumed* continues large, the quantity *taxed* is frequently less than a

third of this amount. Reference is then made to the action of the British government in allowing spirits to be methylated (rendered unfit for a beverage) for use in the arts, to have but a nominal duty, and of the effect of this amelioration, the British officials say "*It is scarcely too much to say that if this mixture had not been devised for the relief of our manufacturers, it would have been almost impossible to maintain the present high rate of duty.*"

The commissioners then argue that, if, in Great Britain, a country of limited area and dense population, with a thoroughly organized revenue system and police, the attempt to maintain this high rate of duty is so unsuccessful, how utterly impossible will it be in a country like the United States, with a sparse and partly disaffected population, to prevent illicit distillation being conducted on a grand scale.

The commission in order to ascertain whether it was the desire of American manufacturers, using alcohol, to have a legal provision for methylating alcohol for their use, had some of it mixed, and imported some of the English spirit so treated, and submitted them to the representatives of various branches in which alcohol is much used. The judgment rendered by these persons was unfavorable to the use of "methylated spirits."

The Report says, "In a communication made to the commission by the American Pharmaceutical Association, the memorialists urge that 'the enormous increase in the price of alcohol (twelve times its former cost) has very materially interfered with the best interests of Pharmacy, by tending to cramp and hinder the progress of the art, and materially lessen the use of alcohol by encouraging the use of imperfect and improper substitutes. This diminished use has by no means reached its limit, and it may be safely estimated for Pharmacy, that if the present high rate of duty be maintained, the use of alcohol will be diminished more than one-half. With half the present rate of duty, Pharmacy might not be seriously affected; and if so, the revenue accruing from one-half the present rate of duty would be larger and be more easily collected than from the existing rates.'"

"In common with the Pharmaceutists, it also appears to be the general opinion of a majority of the representatives of the various trade interests who have appeared before the commission in relation to this matter, that a reduction of the tax on proof spirits to one dollar per gallon would sufficiently relieve them from the injurious effects of the present high price of alcohol, and lead to a very large increase in its consumption for industrial purposes.

The commission argue that the grain producing interests of the country would be benefitted; and, finally, they ask whether it is just and expedient on the part of the Government to impose by law so high a tax on alcohol as to act as a premium for fraud, which it is morally certain human nature as ordinarily constituted, will not resist; and then, secondly, to impose severe

penalties for violation of the law; and whether the hourly provocation to perjury, evasion and concealment, held out by a $2 tax, will not more than counterbalance any good which may result? The commission do not consider thatthe high tax has greatly diminished the use of spirits as a beverage, but that the use of opium and other narcotics has increased in consequence of the tax.

The newspaper reports of the proceedings in Congress, that have from time to time been presented, which throw any light on the subject, indicate a strong indisposition on the part of the Committee of Ways and Means to reduce the tax, and it seems the general impression that they will resist the recommendation of the commission, backed as it is by the mass of testimony and facts they offer. The statistical portions of this Report are quite interesting, and we hope to avail ourselves of them in a future number.

Report No. 8, relative to proprietory and other medicines, perfumery, &c., contains several recommendations which closely concern apothecaries and druggists. The *first* is an addition to paragraph 31, section 79, of the law in which manufacturers are defined, viz:

"*Provided*, That apothecaries who manufacture for their own dispensing and sales to consumers and to physicians, the medicines compounded according to the United States or other national pharmacopœias, or of which the full and proper formula is published in any of the dispensatories now or hitherto in common use among physicians or apothecaries, or in any Pharmaceutical journal now issued by any incorporated College of Pharmacy, shall not be regarded as manufacturers under this act. But apothecaries, and all other persons who manufacture for the dispensing and sales of others, or who make and advertise any article, medicinal or otherwise, simple or compound, with any special proprietory claim to merit or to special advantage in use or effect, whether such claim be based on the properties, qualities, price, or any other distinctive or distinguishing characteristic, whether real or pretended, of the articles so made and advertised, whether such article be or be not made according to the authority above cited in this proviso, the maker or makers thereof shall be regarded as manufacturers under this act."

The reasons given for this proviso are to encourage apothecaries to make their own preparations according to legal authority, and thus be better qualified to give security and bear the responsibility incurred in their sale and use. That as they pay the Government a license to carry on the business of an apothecary, they are only carrying out the business for which this license is given when they prepare the medicines they sell, and hence are not justly to be called upon to pay a manufacturer's license. But when they step aside from their duty as dispensers, and make any preparation largely for the sales of others, they become manufacturers, whether the article prepared be laudanum or cod-liver oil.

Second. They recommend the following addition to paragraph 33, Sec. 79, after the final word alcohol.

"Or of dispensing, upon physicians' prescriptions the wines and spirits officinal in the United States and other national pharmacopœias, either simple or compound, in quantities not exceeding half a pint of either at

any one time, nor exceeding in aggregate cost value the sum of $300 per annum."

This clause, if adopted, will settle the vexed question as to the right of apothecaries to dispense liquors for medicinal use, and compels them to demand a physician's prescription when a sale is to be effected. The inconvenience to the people in legitimate emergencies, arising from the necessity of getting a prescription, will no doubt occasion much complaint; but after considering the whole subject, and the evils arising from the grant of a right to retail liquors to apothecaries, to be regulated by their own judgment of the necessity of the case, we are willing to submit to this inconvenience rather than make tippling shops of our pharmacies. Besides, the apothecary may now keep and sell this class of remedies without being compelled to take out a license as a liquor dealer.

Thirdly, The commission recommend an important change in the proviso of exemptions among stampable articles under Schedule C of the present law, viz:

"*Provided*, That nothing in this act contained shall apply to any uncompounded medicinal drug or chemical, nor to any medicine compounded according to the United States or other national pharmacopœia, or of which the full and proper formula is published in any of the dispensatories now or hitherto in common use among physicians and apothecaries, or in any Pharmaceutical journal now issued by any incorporated College of Pharmacy, and not sold or offered for sale, or advertised under any other name, form or guise than that under which they may be severally denominated and laid down in said pharmacopœias, dispensatories or journals as aforesaid; nor to medicines sold to or for the use of any person, which may be mixed and compounded, for said person according to the written receipt or prescription of any physician or surgeon. But nothing in this proviso shall be construed to exempt from stamp duty any and all medicinal articles, whether simple, or compounded by any rule, authority or formula, published or unpublished, which are put up in a style or manner similar to that of patent or proprietory medicines in general, and advertised in newspapers or by public handbills for popular sale and use as having any special proprietory claim to merit, or to any peculiar advantage in mode of preparation, quality, quantity, price, use or effect, whether such claim be real or pretended."

The changes are intended to circumscribe the books considered as authorities for exempting formulas, and especially cutting off "formularies and text books," and to define clearly what is intended by a proprietary article, showing that a mere change in the wording of a label may convert a free article into a stampable one. To illustrate this point, cod-liver oil is instanced. Any one may put up cod-liver oil, and speak of it as pure and carefully prepared, and may state that it is used in affections of the chest, with the dose; and also that it is carefully made or prepared by A. or B., and it is stamp free. But if the same oil is put up with labels stating it to be X. or Y.'s celebrated cod-liver oil for the cure of consumption, &c., &c., prepared by a peculiar process, that renders it better than other oils, etc., then it becomes proprietory and is stampable. We think this is as it should be, and hope the recommendation will become

a law, because where a man assumes this proprietory relationship to an article, he claims an advantage over those who don't see proper to take that course, and he should be willing to pay for the privilege. *Finally*, the commission recommend that the present law relative to proprietory stamps be so changed and amended, that *every ten cents value on a medicine or article shall require a one cent stamp.* So that a dollar article which now requires a four cent stamp, will need a *ten* cent stamp. But the stampable value of the article must be its retail price, *as fixed by the maker*, and this gives the maker the power to increase the price to meet the tax if he chooses. For ten cent articles the tax operates more justly than the present one; but it may be doubted whether this tax should be laid, in justice to manufacturers, if the tax on alcohol is not reduced. The reason for raising the stamp tax to ten per cent. is to reverse the unjust discrimination which now exists against legitimate Pharmacy, by making it greater than the manufacturer's tax instead of less, as it now stands.

Second Annual Report and Proceedings of the Alumni Association of the Philadelphia College of Pharmacy, containing also the Valedictory Address delivered to the Graduating Class of 1866, by Wm. Procter, Jr, Professor of Pharmacy in the College. Philada., 1866.

This is a neatly printed pamphlet of forty pages, edited by the Secretary of the Alumni, Mr. William C. Bakes.

The Association met on the afternoon of the 16th of March. In the absence of the President, Vice-President Ferris Bringhurst took the chair. The Annual Report of the Secretary was then read and adopted. Fifteen gentlemen were elected members by ballot; a committee to nominate officers appointed; also a committee in reference to the resignation of Professor Procter; the Treasurer's report read and referred to an auditing committee, when the Association adjourned until the 17th.

March 17th. President, T. S. Wiegand in the chair. The Committee on Nominations reported the names of *T. S Wiegand* for President, *Chas. L. Eberle* and *Ferris Bringhurst* for Vice-Presidents, *Wm. C. Bakes* for Secretary, *Adolph W. Miller* for Corresponding Secretary, *Alfred Mellor* for Treasurer, and Messrs. F. Gutekunst, Henry Bower, Jos. C. Kirkbride, H. N. Rittenhouse, E. C. Jones and A. Blair as the Executive Board. The President then read his address, which we have not space for. Several original communications were then read on scientific subjects, followed by discussions, particularly in reference to Wax in Cerates. The Committee appointed relative to the resignation of the Professor of Pharmacy in the College reported a preamble and resolutions, which were unanimously adopted and an engrossed copy directed to be presented to Prof. Procter.

The Auditing Committee reported that the Treasurer's Account was correct. The Secretary was instructed to edit and publish the proceedings, when the meeting adjourned.

Descriptive Catalogue of Fluid and Solid Extracts in Vacuo; also concentrations and officinal pills, prepared by Henry Thayer & Company. With formulas and receipts. Cambridgeport, Mass., 1866.

From the elegant manner in which this catalogue is gotten up, one might fancy it a book intended for the parlor table, being well printed on expensive paper, and handsomely bound. It is not a mere catalogue of preparations, however, having some claims that point to Materia Medica, and many recipes for preparations in Pharmacy; but on close examination it will be observed that, though a catalogue of fluid extracts, anda catalogue of formulas, it contains no formulas of fluid or solid extracts, and that nearly all the other preparations are made from the fluid extracts. In fact, it is the same method of advertising Mr. Thayer's fluid extracts that a few years back was practised by Tilden & Company in a similar volume. The idea is, that physicians and apothecaries will find it convenient to make the preparations of the Pharmacopœia from these fluid extracts, and thus save all the labor and trouble and skill required to prepare them from the drugs. Now we protest against this procedure as calculated to injure the practice of Pharmacy and lower its standard, removing from those who use these extracts for this purpose all means by which they can know the quality of the resulting dilutions. It would be some reason in its favor did we know that the preparations it advertises were made by the Pharmacopœia recipes, when officinal, but there is no evidence on this point. It is high time that a stand should be made against the encroachments of manufacturing Pharmaceutists on the proper business of the apothecary. Apart from this tendency of the book, we have nothing against it. It exhibits great enterprise on the part of the manufacturer, and contains much information of a useful character.

Circular No. 6. War Department; Surgeon General's Office, Washington Nov. 1, 1865. Reports on the extent and nature of the materials available for the preparation of a medical and surgical history of the Rebellion. Printed for the Surgeon General's Office, by J. B. Lippincott and Co.; Philadelphia, 1865.

We are indebted to Surgeon General Barnes for a copy of this "circular," which, in common with all things connected with the war, is on a grand scale. It is in quarto, 161 pages, and consists of a series of reports from medical officers on the materials and their extent and nature, available for the preparation of a medical and surgical history of the war, and drawn up under the supervision and direction of Surgeon J. J. Woodward of the Surgeon General's Office. The mass of materials appears to be very large, and the records, in connection with the immense museum of pathological specimens, are of great value, the result of a systematic course of collection and preservation that has been going on since July, 1862, previous to which time but little attention was given to the subject. It is to be presumed that the proposed history will include a full account

of the pharmaceutical department of the operations of the War Office, a subject not touched upon in this circular except where it alludes to medical wagons, medical knapsacks and chests and other arrangements for holding and conveying medical supplies on the field. We hope the department will include a full history of the Medical Purveying operations, Laboratories, Storekeeping, Hospital Stewards and the pharmaceutical service in local Hospitals in their work, if it should go on, and do full justice to the numerous body of young men who were in this service with little emolument during the war, and we shall be much pleased to receive, as occasion offers, any publications bearing on this subject that may be issued by the Department.

Transactions of the Pennsylvania Horticultural Society for the year 1865. Philadelphia, 1866, pp. 96 octavo.

This interesting pamphlet, for which we are indebted to Mr. James, contains the address of D. Rodney King, President of the Society, and the transactions during the year. The latter part of the volume consists of essays contributed by members on various subjects connected with Horticulture. Among them we notice the following: On Pear Culture, by Robert Cornelius, of Philadelphia; On the Odors of Flowers, by A. W. Harrison; A glance at the Flora of the Carboniferous period, by Dr. Horatio C. Wood, Jr.; On Ferns and Mosses, by Thomas P. James, Professor of Botany to the Society; and, finally, an interesting report on the Curculio, by Prof. S. S. Rathvon, of Lancaster. The plan of publishing reports and essays is a good one, and should be continued and extended. We hope to avail ourselves of extracts from its pages in a future number.

Books and New Medical Journals received:—

Biographical sketches of distinguished living New York Surgeons. By Samuel W. Francis, A. M., M. D., Fellow of the New York Academy. Reprinted from the Philadelphia Med. and Surg. Reporter. New York, published by John Bradshaw, 1866, pp. 220 12mo.

The Detroit Review of Medicine and Pharmacy, edited by Geo. P. Andrew, M.D., Samuel P. Duffield, Ph. D., and Edward W. Jenks, M. D. Vol. i. No. 1. April, 1866.

The Savannah Journal of Medicine, edited by Uriah Harriss, M.D., J. B. Read, M. D., J. G. Thomas, M. D. Vol. v. Nos. 1 and 2. Bi-monthly, commencing Jan. 1, 1866.

The Medical Reporter, a semi-monthly Record of Medicine and Surgery, edited by W. B. Alleyne, M. D., and O. F. Potter, M. D. St. Louis, March 15, 1866, vol. i. Nos. 2 and 3.

The Medical Record, a semi-monthly Journal of Medicine and Surgery. New York, March 15, 1866, vol. i. Nos. 1 and 2, pp. 24; edited by George F. Shrady, M. D.

The New York Lancet, a family Medical Journal, vol. i. No. 5, March 15.